DEVELOPING OF STUDENT WORKSHEET BASED GUIDED INQUIRY ON MAGNETISM MATTER SUB THEME ISLAMIC KINGDOM IN INDONESIA TO UNDERSTANDING OF CONCEPT FOR FIFTH GRADE STUDENTS AT SDN DINOYO 2 MALANG

THESIS

Presesnted to Faculty of Tarbiyah and Teacher Training Faculty
Maulana Malik Ibrahim State Islamic University Malang
in Partial Fulfillment of the Requirements for *the Degree of Sarjana Pendidikan (S.Pd)*

Written by:
Niken Farida Hanum
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ISLAMIC ELEMANTARY SCHOOL TEACHER EDUCATION
TARBIYAH AND TEACHER TRAINING FACULTY
MAULANA MALIK IBRAHIM STATE ISLAMIC UNIVERSITY
MALANG
2017

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DEVELOPING OF STUDENT WORKSHEET BASED GUIDED INQUIRY ON MAGNETISM MATTER SUB THEME ISLAMIC KINGDOM IN INDONESIA TO UNDERSTANDING OF CONCEPT FOR FIFTH GRADE STUDENTS AT SDN DINOYO 2 MALANG

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DEVELOPING OF STUDENT WORKSHEET (LKS) BASED GUIDE INQUIRY ON MAGNETISM MATTER SUB THEME ISLAMIC KINGDOM IN INDONESIA TO UNDERSTANDING OF CONCEPT FOR FIFTH GRADE STUDENTS AT SDN DINOYO 2 MALANG

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Assalamu'alaikum Wr. Wb.

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Malang, May 15th, 2017

Author,

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MOTTO

سُبْحَانَ الَّذِي خَلَقَ الْأَزْوَاجَ كُلَّهَا مِمَّا تُنْبِتُ الْأَرْضُ وَمِنْ أَنْفُسِهِمْ وَمِمَّا لَا يَعْلَمُونَ ﴿٣٦﴾

"Exalted is He who created all pairs-from what the earth grows and from themselves and from that which they do not know." (Q.S Yasin:36)

DEDICATION

Alhamdulillahhirabbil'alamiin, thanks to Allah SWT for everything in my life.

My deepest gratitude in bestowed to the Almighty, the One Allah SWT

I'm dedicated this research for my beloved Father and Mother (Mr. Poerwantoro and Mrs. Rindaningtias), who had been struggling in giving me support and praying until I finished all these.

My beloved sisters (Nimas Ayyu Fauziah and Niajeng Izza Rahma) who had been always following me help, both of moral and material. My big family namely, my uncles and my aunts who had been help me and motivated me.

Thank you for supporting and motivating me. May Allah SWT bless you all.

Amiiin.

I hope result of this research give inspiration to all.

TRANSLATION GUIDELINES OF ARAB LATIN

Translation of Arab Latin in this thesis utilize the translation guidelines based on the agreement between Religion Minister and Educational and Culture Minister of Indonesia number 158, 1987 and no. 0543 b/U/1987.

A. Hijaiyah Letters

ا = **a**	ز = **z**	ق = **q**
ب = **b**	س = **s**	ك = **k**
ت = **t**	ش = **sy**	ل = **l**
ث = **ts**	ص = **sh**	م = **m**
ج = **j**	ض = **dl**	ن = **n**
ح = **h**	ط = **th**	و = **w**
خ = **kh**	ظ = **zh**	ه = **h**
د = **d**	ع = **‘**	ء = **,**
ذ = **dz**	غ = **gh**	ي = **y**
ر = **r**	ف = **f**	

B. Long Vocal

Vocal (a) long = â

Vocal (i) long = î

Vocal (u) long = û

C. Diphthong Vocal

وْاَ = aw

ياَ = ay

وْ = û

ABSTRAK

Farida, Niken. 2017. *Developing of Student Worksheet Based Guided Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in Indonesia to Understanding Concept for Fifth Grade Students at SDN Dinoyo 2 Malang.* Skripsi. Jurusan Pendidikan Guru Madrasah Ibtidaiyah. Fakultas Ilmu Tarbiyah dan Keguruan. Universitas Islam Negeri Maulana Malik Ibrahim Malang. Pembimbing: Dr. Muhammad Walid, MA

Kata Kunci: LKS, Inkuiri Terbimbing, Gaya Magnet, kelas V SD/MI.

Pengembangan Lembar Kerja Siswa Gaya Magnet Berbasis Inkuiri Terbimbing merupakan salah satu sarana guna membantu pemahaman siswa dalam pembelajaran. Melalui Lembar Kerja Siswa ini, diharapkan siswa dapat termotivasi dan dapat menumbuhkan keterampilan ilmiah siswa, serta sebagai upaya membiasakan siswa bekerja keras untuk memperoleh pengetahuan. Lembar Kerja Siswa dapat mendukung proses pembelajaran IPA Gaya Magnet. Materi pokok yang dibahas adalah materi tentang gaya magnet. Inkuiri terbimbing mengajak siswa untuk membangun pengetahuan baru dengan melakukan percobaan dan disuguhi dengan pertanyaan yang mengarahkan siswa untuk memecahkan suatu masalah. Oleh karena itu, peneliti mengembangkan Lembar Kerja Siswa Berbasis Inkuiri Terbimbing.

Jenis penelitian ini adalah *Research and Development*, yang mengacu pada model Borg and Gall. Sampel dalam penelitian ini adalah siswa kelas V SDN Dinoyo 2 Malang. Untuk mengetahui adanya pengaruh Lembar Kerja Siswa Gaya Magnet Berbasis Inkuiri Terbimbing terhadap hasil belajar siswa di gunakan *Pre Test* dan *Post Test Control Group Design*.

Hasil dari penelitian pengembangan Lembar Kerja Siswa gaya magnet berbasis inkuiri terbimbing ini dilengkapi dengan konsep-konsep materi pada setiap pembahasan dan juga dilengkapi dengan soal pemahaman konsep di akhir. Hasil belajar siswa kelas eksperimen mencapai rata-rata nilai *post-test* 80 dan hasil belajar siswa kelas kontrol mencapai rata-rata nilai *post-test* 58. Berdasarkan hasil uji-t dengan taraf signifikansi 0,05 diperoleh hasil yaitu t_{hitung} (10.65) > t_{tabel} (2.01), hal ini menunjukkan bahwa terdapat perbedaan yang signifikan antara kelas eksperimen dan kelas kontrol. Perbedaan ini dipengaruhi oleh Lembar Kerja Siswa yang telah dikembangkan. Sehingga dapat memudahkan siswa dalam memahami konsep yang dipelajarinya

ABSTRACT

Farida, Niken. 2017. *Developing of Student Worksheet Based Guided Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in Indonesia to Understanding Concept for Fifth Grade Students at SDN Dinoyo 2 Malang.* Skripsi. Islamic Elemantary School Teacher Education. Tarbiyah and Teaching Training Faculty. Maulana Malik Ibrahim State Islamic University Malang. Advisor: Dr. Muhammad Walid, MA

Keywords: LKS, Guided Inquiry, Magnetism Matter, Fifth grade SD/MI.

Development of Student Worksheet or *Lembar Kerja Siswa* Based Guided Inquiry Magnetic Force is one means to help the understanding of student learning. Through Student Worksheet, students are expected to be motivated and able to grow scientific skills students, as well as efforts to familiarize students work hard to gain knowledge. Student Worksheet can support the learning process of IPA especially Magnetic Force. The subject matter discussed is the matter of the magnetic force. Guided inquiry leads students to build new knowledge by experimenting and being treated to questions that lead students to solve a problem. Therefore, the researcher develops Student Worksheet based guided inquiry.

This type of research isResearch and Development, which refers to the model Borg and Gall. The sample in this study is the fifth grade students at SDN Dinoyo 2 Malang. To determine the influence of teaching materials Development of Student Worksheet Based Guided Inquiry Magnetic Force to the student learning result using Pre-Test and Post-Test Control Group Design.

The result of the research of the development of Student Worksheet on Magnetism Matter Based Guide Inquiry is complemented by the material concepts in each discussion and also comes with a conceptual comprehension at the end materials. The results of the experiment grade students achieved an average value of80 and a post-test control class student learning outcomes achieved an average post-test score 58. Based on the results of the t-test with a significance level of 0.05 was obtained results are t_{hitung} (10.65) > t_{tabel} (2.01), this indicates that there are significant differences between the experimental class and control class. This difference is influenced by the Student Worksheet have been developed. So as to help students understand the concepts learned

ملخص البحث

فريدة، نيكن. 2017. *تطوير ورقة الأعمال للتلميذ مؤسسا على طريقة الاستفسار الموجه في مادة المغناطيسية و موضوع المملكة الإسلامية في اندونسيا لترقية فهم الفكرة لدي التلامذ الفصل الخامس في المدرسة الابتدائية الحكومية 2 دينويو مالانق*. بحث العلمي. قسم تعليم المدرس المدرسة الابتدائية، كلية العلوم التربية و التعليم، جامعة مولانا مالك ابراهيم الإسلامية الحكومية مالانق. المشرف: الدكتور محمد والد الماجستير.

الكلمة المفتاحية: ورقة الأعمال للتلميذ، الاستفسار الموجه، المغناطيسية، الفصل الخامس بالمدسة الابتدائية.

تطوير ورقة الأعمال للتلميذ مؤسسا على طريقة الاستفسار الموجه هو إحدى الوسيلة لمساعدة التلامذ في فهم الدرس. و بوسيلة ورقة الأعمال للتلميذيرجى التلامذ أن يشجع و يقدر أن ينشأ براعتهم العلمية، و كانت ورقة الأعمال للتلميذ محاولة لتعويد التلامذ بالجهد لطلب العلم. كلنت ورقة الأعمال للتلميذ تقدر أن تدعم تعليم العلوم الطبيعية في المادة المغناطيسية. و المادة الأساسية هي عن مغناطيسية. و كانت طريقة الاستفسار الموجه يدعو التلامذ أن يجرب و التلامذ سيسأل الأسئلة التي توجههم لحل المشكلة. و لذالك طورت الباحثة ورقة الأعمال للتلميذ مؤسسا على طريقة الاستفسار الموجه.

نوع البحث هو البحث و التطوير الذي يستخدم نظرية فورج و جال. و عينة البحث هي التلامذ من الفصل الخامس بالمدرسة الابتدائية الحكومية 2 دينويو مالانق. و تستخدم الباحثة الاختبار ما قبل و بعد و تصميم المرقابة المجموعة لمعرفة أثر ورقة الأعمال للتلميذ مؤسسا على طريقة الاستفسار الموجه في نتيجة التعلم التلامذ.

كانت نتيجة البحث عن تطوير ورقة الأعمال للتلميذ مؤسسا على طريقة الاستفسار الموجه كاملة بأشكال المادة في كل البحث و السؤال في آخرها. و نتيجة

التلامذ في الفصل التجريبي تبلغ 80 إجماليا. و نتيجة التلامذ في الفصل المراقب تبلغ 58 إجماليا. بنظر إلى نتيجة التجربة t– مع مستوى مهمة 0،05 توجد الحاصل t الحساب (10.65) t> جدول (2.01). فلذالك يوجد الاختلاف بين الفصل التجريبي و الفصل المراقب. و يؤثر الاختلاف بورقة الأعمال للتلميذ المتطور الذي يسهل التلامذ في فهم الدرس.

PREFACE

بسم الله الرحمن الرحيم

Alhamdulillah, praise the authors are extended presence to Allah who has given grace, His taufiq and guidance, so that I can finish this thesis with the tittle *"Developing of Student Worksheet Based Guided Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in Indonesia to Understanding of Concept for Fifth Grade Students at SDN Dinoyo 2 Malang"*.

Blessing and greetings is always delegated to The Prophet Muhammad SAW, who has been brought the Islamic religion from the darkness to the lightness.

Writing and preparation of this thesis intended to complete of all activities study at Maulana Malik Ibrahim State Islamic University of Malang as a form of accountability students writers become the student of Maulana Malik Ibrahim State Islamic University of Malang and to comply one of the requirements to obtain a first degree in Bachelor of Education in Maulana Malik Ibrahim State Islamic University of Malang.

The author is fully aware that the limited ability and lack of experience, so many obstancles and difficulties encountered in the preparation of the writer continues the thesis. By the finish of the thesis, the author did not forget to express the thanks to all those who provide direction, guidance in the preparation of the writer continues this thesis, with all humality, say thanks to:

1. Mr. Prof. Dr. H. Mudjia Rahardjo, M. Si, as the Rector of Maulana Malik Ibrahim State Islamic University of Malang.

2. Mr. Dr. H. Nur Ali, M. Pd, as the Dean of Tarbiyah and Teaching Training Faculty at Maulana Malik Ibrahim State Islamic University of Malang.
3. Mr. Dr. Muhammad Walid, MA, as the thesis Advisor and the Head of Islamic Elemantary School Teacher Education at Maulana Malik Ibrahim State Islamic University of Malang.
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6. Mr. Dr. Abdussakir, M.Pd and Mr. Agus Mukti Wibowo, M.Pd as examiner.
7. Mrs. Ratnaningsih, S.Pd as the Headmaster of SDN Dinoyo 2 Malangand the teachers who have allowed the authors to conduct research at the school.
8. Mrs. Nunik Martin Lestari, S.Pd, as the teacher of class in fifth grade A as class experiment
9. Mrs. Sere Raya Sianturi, S.Pd, as the teacher of class in fifth grade B as class control
10. All of the fifth grade students at SDN Dinoyo 2 Malang who helped the research process.
11. The last time on all those who have always supported and motivated me to always be active in the pursuit of learning and optimistic ideas.

The author realizes its full of weakness, so that in completing this thesis there are many mistake and short comings. The author expects that there suggestions snd critism from all walks of life in order to improve this thesis. With all humility, the authors hope what the authors report can provide benefits, especially for writers and generally for readers to improve the quality of learning. Aamiiin.

Malang, 15th May 2017

Authors

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CHAPTER I

INTRODUCTION

A. Background

Science or natural science is a science that subject considering something related to nature and all its contents. Things that need to be learned or observed in these subjects are to understand events in the universe. According to Izzak H. Wenno that studied in science is *"Sebab-akibat, hubungan kausal dari kejadian-kejadian yang terjadi di alam"*[1]

One of the disciplines that are taught in primary schools and closely related to the phenomena that occur in the environment students in everyday life is The Natural Science Subjects or *Ilmu Pengetahuan Alam* (IPA). IPAis a collection of various branches of science which biology, physics, chemistry, and so on. The hope of learning the IPA to learn ourselves and the nature around. It is according to Eneng Khoirunisa *"Pendidikan IPA diharapkan dapat menjadi wahana bagi peserta didik untuk mempelajari diri sendiri dan alam sekitar, serta prospek pengembangan lebih lanjut dalam menerapkannya di dalam kehidupan sehari-hari"*[2]

In curriculum 2013, IPA and IPS subject as separate subjects to grade IV-VI. With the subjects of IPA or IPS, the process of learning in elementary school

[1]Izaak H. Wenno, *Pengembangan Model Model IPA berbasis Problem Solving Method berdasarkan Karakteristik Siswa dalam Pembelajaran di SMP/ MTS,* FKIP Universitas Pattimura Ambon. Juni 2010 Th. XXIX No.2, p. 176

[2]Eneng Khoirunisa, *Meningkatkan hasil Belajar Siswa pada Pelajaran IPA Materi Siklus Air dengan Menerapkan Metode Pembelajaran Eksperimen Penelitian Tindakan Kelas terhadap Siswa Kelas V SDN Bunisari Semester II Cianjur*, PGSD Universitas Pendidikan Indonesia 2013, p. 7

can still be carried out with thematic that integrationapproach. The approach used in the study is scientific integrative thematic learning. Its activities are observ, ask, try, process, present, and conclude all subjects.[3]

IPA is a science that is obtained through the process of observation and experiment. According to Powler in Usman is *"IPA merupakan ilmu yang berhubungan dengan gejala alam dan keberadaan yang sistematis yang tersusun secara teratur, berlaku umum yang berupa kumpulan dari hasil observasi dan eksperimen/ sistematis (teratur)..."*[4]

IPA learning is based on real activity, meaning that students do their own experience to discover the truth. For example, what is the correct magnet with pole namesake starting refused? Then the students need to do an experiment to prove the hypothesis. There are four reasons the IPA was taught at school. It is according to Usman,

> a) .... pengetahuan dasar untuk teknologi adalah IPA .... b) .... IPA diajarkan dengan mengikuti metode "menemukan sendiri" .... c) Bila IPA diajarkan melalui percobaan-percobaan yang dilakukan sendiri oleh anak, maka IPA tidaklah merupakan hapalan belaka, d) mata pelajaran ini mempunyai nilai-nilai pendidikan yaitu mempunyai potensi yang dapat membentuk kepribadian anak secara keseluruhan.[5]

IPA learning is a container or a place for the child to develop his/her ability through the experiences or activities undertaken individually and in groups. Through these experiences students can correct the mistakes of the concept contained in science material and building of new concepts that must be mastered.

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[3]E. Mulyasa, *Pengembangan dan Implementasi Kurikulum 2013* (Bandung: PT Remaja Rosdakarya, 2015), p. 85-86

[4]Usman Samatowa, *Pembelajaran IPA di Sekolah Dasar* (Jakarta: PT Indeks, 2011), p. 3

[5]*Ibid.*, p.4

Teaching in elementary school can be done in a group. In accordance with the statement of Desmita that *"...anak usia sekolah dasar ini lebih menekankan pada pentingnya aktivitas bersama-sama, seperti berbicara, berkeluyuran, berjalan ke sekolah, berbicara melalui telepon, mendengarkan musik, bermain game, dan melucu"*[6]. Jointly activity can be built through learning activities that emphasize the psychomotor activity. Grade IV-VI had already entered the stage of abstract thought (formal operations), so it's been able to understand simple scientific concepts.[7]

At the level of Elemantary School students have had the experience of knowledge related to the IPA. For example, the student understands that all metals can be attracted by a magnet, but in reality not all metals can be attracted by a magnet. These experiences have had an impact on the perception of the child so that in his mind formed intuition and theory of the IPA before they learn in school. The theory some of the understanding that compliance with the understanding of concept, but also many different understanding of the fact with the concept exists.

To understanding of concept that will be expressed in learning, teachers must entered into the real world students in order for them to feel near that *IPA* is part in daily life. In accordance with the statement of Asih and Eka that, *"Ketika dalam pemahaman konsep-konsep IPA tidak disertai dengan pengaruh langsung*

[6]Desmita, *Psikologi Perkembangan Peserta Didik* (Bandung: PT Remaja Rosdakarya, 2014), p. 224

[7]E. Mulyasa, *op.cit*, p. 86

dengan kehidupan nyata maka siswa akan berusaha menghubungkan sendiri konsep IPA dengan apa yang mereka jumpai pada kehidupan nyata"[8]

The causes of the misconceptions students can come from books or teachers. It is revealed by Ibrahim Laily in that,

> Miskonsepsi terjadi dapat bersumber dari berbagai hal, antara lain dari dalam dan di luar sekolah. Guru dan buku dapat menjadi sumber miskonsepsi yang terjadi di sekolah, lingkungan juga dapat menjadi penyebab miskonsepsi yang terjadi di luar sekolah. Miskonsepsi terjadi karena adanya kesalahpahaman tentang suatu konsep, seseorang yang memiliki miskonsepsi sangat sulit untuk diubah pandangannya.[9]

Submission of material IPA through Students Worksheet or Lembar Kerja Siswa (LKS) based on the achievement of desired competencies as well as engaging students with real objects so that students can explore themselves to gain an understanding of the concepts already exist through meaningful experiences. The development of learning materials and resources in a systematic and integrated learning required in so that students can master every competence completely.[10]

Teaching materials developed by the researchers is Students Worksheet. Students Worksheet as expected to help students in the classroom, through activities that are packaged in a group so that students are interested in studying feel that Students Worksheet is very close to them. The presence of the teacher serves as a directors in learning activities. While text books as a source of

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[8]Asih Widi Wisudawati dan Eka Sulistyowati, *Metodologi Pembelajaran IPA* (Jakarta: PT Bumi Aksara, 2014), p. 234

[9]Laily Istighfarin dkk., *Profil Miskonsepsi Siswa pada Materi Struktur dan Fungsi Jaringan Tumbuhan*. Jurnal UNESA, Universitas Negeri Surabaya. Vol. 4 No. 3 Sepetember 2015.

[10] AbdulMajid,*Perencanaan Pembelajaran*(Bandung: PT Remaja Rosdakarya, 2009), p.169

information and other media are indispensable to stimulate the student learning activities.

Based on interviews of researchers with teacher at VA in SD Negeri Dinoyo 2 Malang, explained that:

> "Dalam pembelajaran kurikulum 2013 kita para guru dituntut lebih aktif dengan media. Tapi, di SD ini belum pernah ada LKS gaya Magnet yang berisi eksperimen *gitu*. Anak-anak kadang *ya* salah konsep. Buku-buku yang ada selama ini belum bisa memberikan pemahaman konsep dan aktivitas yang sebenarnya. Keinginan guru dan terutama siswa yaitu adanya LKS yang menarik sehingga bisa meningkatkan minat belajar siswa agar konsep yang dipelajari tidak jauh berbeda dengan yang sebenarnya. Siswa kelas V sangat senang diajak melakukan aktivitas seperti praktikum, apalagi jika kegiatannya siswa belum pernah melakukan pasti penasaran."[11]

Students Worksheet used students currently would be developed different with other researchers. The difference lies in the activities that will be developed by the researchers. That will be developed is Students WorksheetBased Guided Inquiry which do the students are grouped in accordance with the characteristics of students who like group activities, however, teachers keep controlling, and guide the course of the activity of the students. The goal of teacher keep controlling is to make concept invented by students is not much different with the concept.

Based on the description in the background above, then the necessary solve by developing such a product be Students Worksheet so that the experiment was able to increase an understanding of the concept of students. Researchers conducted a research with the title is**"Developing of Student Worksheet Based Guided Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in**

[11]Wawancara dengan Bu Nunik, Guru Kelas V A, tanggal 5 Oktober 2016

Indonesia to Understanding of Concept for Fifth Grade Students at SDN Dinoyo 2 Malang"

B. Problem Formulation

Based on the background that is mentioned above, developing of Students Worksheet Based Guided Inquiry can be formulated as follow:

1. How is explain the product development of Students WorksheetBased Guided Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in Indonesia to understanding of concept?
2. How is the validity of product development isStudents Worksheetthat developed?
3. How is the difference in the level of understading of magnet concept who students not use Students Worksheet with students use Students Worksheetthat developed?

C. Study Objectives

Based on the problem of the fore mentioned problems, the study aims to:

1. To explain the product in the form of Students Worksheet Based Guided Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in Indonesia to undertansing of concept
2. To explain the validity of product development is Students Worksheet that developed
3. To explain the difference in the level of understading of magnet concept who students not use Students Worksheet with students use Students Worksheet that developed

D. Significances of the Research

In this Research and Development, researcher hope that the result of this research can provide usefulness and benefits for various parties, including:

1. Theoretically

For the development of Islamic ElemantarySchool Taecher Education or *Pendidikan Guru Madrasah Ibtidaiyah* (PGMI). In General, and specifically gives an example of the practical measures for the development of systemic Student Worksheet in elementary school.

2. Practically

To donate Student Worksheetreference for basic education unit i.e. Elementary School (SDN Dinoyo 2 Malang), particularly related to the field of study of science teachers science fields of study in particular fields of study and teachers the grouping of subjects as well as other subjects.

3. For Elemantary School researched

For consideration in determining is Student Worksheetand also the quality of learning and that can form the student has a winning character, also motivate teachers to enrich the material by creating and developing its own, such as Student Worksheet, hand out, modules, and so on in accordance with the needs and characteristics of the students.

E. The Development Assuming

Some of the assumptions the reserach is as follow:

1. Experiment Student Worksheet based on Curriculum 2013

2. The arrangement is Student Worksheet experimental in design as attractive as possible, students will be more than axcited to read, andcarry out experiment that is in the book
3. Students assumed s are more motivated, social interactions, and more controlled the direction by using Student Worksheetdeveloped
4. Students who are using this Student Worksheetcan increase the understanding of the concept of magnetic force
5. Substances of content outlined offers a variety of ideas that can cultivate creativity and innovation for students

F. Scope of the Research

Developing of Student Worksheet is limited to the subjects of science fifth grade semester 2 chapters of magnetic force, which consists of the following subjects:

1. The nature and characteristics of magnet
2. Make the simple magnet
3. Make the simple compass
4. The benefits of magnet

G. Product Specifications

This research will produce products for teachers and students in the form of Student Worksheet. Student Worksheetis generated in the form of a textbook to learn students independently or in a group with the guidance of teacher. The difference between these is Student Worksheetwith it existing in terms of matter lies in providing an understanding of the concept of magnetism material. Besides

the presentation of the material has also been adapted to the students education level, i.e. for fifth grade in elementary school. The development of learning materials is expected to have the following specs:

1. In terms of form, the resulting materials are print media in the form of Student Worksheet
2. From the aspect of content is Student Worksheet consisting of four parts, i.e pre-preface, the introduction, the content and the supporting parts

a. Pre-preface
   1) Cover
   2) Inside cover
   3) Preface
   4) Table of contents
   5) Concept map.

b. Introduction
   1) Title
   2) Core competencies
   3) Basic competencies
   4) Indicators

c. The content

The core part of this learning materials include: (1) learning objectives, (2) materials, (3) experimental activity, (4) advanced tasks, (5) the exercise of understanding concepts, and (6) a test of the ability of the students.

d. The Supporting Parts

1) Inventors figure

2) Summary

3) *Soal Pemahaman Konsep* (SAMAK)

4) Bibliography

3. In the terms of overview

Things to considered in terms of appearance this Student Worksheet. *First*, of the type and size of the letters used the typeface *Comic Sans MS* with a font size of 14 adjusted to fifth grade in elementary school. *Second*, structuring and page numbering field print learning materials using A4 paper 80 grams. The selection of paper 80 g is because the content of the materials this full colour so that it takes the paper is thick and not translucent colors. *Third*, colour illustrations using interesting materials and bright colors as well as full colour so that students interested to reading materials.

H. Previous Research

Researchers previously have found some previous research that discusses the research and development. Previous research is research that has been done before by other researchers. The goal was as material input for researchers to compare between newbies and research with each other. Before described on theories relating title of the research "Developing of Student Worksheet Based Guided Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in Indonesia to Understanding of Concept for Fifth Grade Students at SDN Dinoyo 2 Malang",

previously will be presented regarding some previous research that can support this research. Previous research used in this study are as follows:

Research conducted by K. Dewi et.al in the form of a journal entitled *"Pengembangan Perangkat Pembelajaran IPA Terpadu dengan Setting Inkuiri Terbimbing untuk Meningkatkan Pemahaman Konsep dan Kinerja Ilmiah Siswa"*. The research method used was a researcher of research and development. The issue discussed this there are three researchers (3) as to the validity of the study, the practicability of learning and effectiveness learning devices. The results of his research is integrated with the IPA learning device setting inquiry the developed social interactions are qualified validity, practicality and validity. The similarities of this research is the development done in the sphere of IPAsubjects, using methods of research and development, and Guided Inquiry to improve the understanding of students. The difference from this research is that this research was conducted at junior high school not on elementary school students, which was developed in this research is the study shaped the Student Worksheet rather than on the Textbook.[12]

Research conducted by Dyah Shinta Damayanti in the form of a journal entitled *"Pengembangan Lembar Kerja Siswa (LKS) dengan Pendekatan Inkuiri Terbimbing untuk Mengoptimalkan Kemampuan Berpikir Kritis Peserta Didik pada Materi Listrik Dinamis SMA Negeri 3 Purworejo Kelas X Tahun Pelajaran 2012/ 2013"*. The research method used was a researcher of research and development. The issue discussed this there are three researchers (3) as to the

[12] K. Dewi et.al, *Pengembangan Perangkat Pembelajaran IPA Terpadu dengan Setting Inkuiri Terbimbing untuk Meningkatkan Pemahaman Konsep dan Kinerja Ilmiah Siswa* (Universitas Pendidikan Ganesha: Jurnal Volume 3, 2013)

validity of learning, attractiveness against students who use it, and the feasibility of Student Worksheetthat used in the learning process. The results of the research show that this is Student Worksheet can be used in the learning process and can be further developed with material or different levels. The similarities in this research is a method used is the Research and Development and with the approach of the guide inquiry. The difference in this research is the development of the Student Worksheet is not a Textbook, doing research on Dynamic Electric material not on the Magnet, the object of research is the senior high school students of class X, and the purpose of the study was to optimize the critical thinking ability learners.[13]

Research conducted by Kt. Puspawati et.al in the form of a journal entitled *"Pengaruh Model Pembelajaran Inkuiri Terbimbing Berbantuan Media Konkret terhadap Pemahaman Konsep IPA Siswa Kelas V SD Gugus V Kecamatan Buleleng".* The research method used was a researcher of quasi experiment. The problems discussed the differences researchers students who follow the understanding of the concept of guide inquiry learning with *IPA* using concrete media. The results of his research that there is a significant difference between the concept of understanding IPA students who follow Guided Inquiry with the model assisted concrete media with models direct learning in students. The similarities in this research is a the scope of subjects, the learning model use Guided Inquiry and focus research on the students of fifth grade. Differences in this study is the

[13] Dyah Shinta Damayanti et.al, *Pengembangan Lembar Kerja Siswa (LKS) dengan Pendekatan Inkuiri Terbimbing untuk Mengoptimalkan Kemampuan Berpikir Kritis Peserta Didik pada Materi Listrik Dinamis SMA Negeri 3 Purworejo Kelas X Tahun Pelajaran 2012/ 2013, (*Universitas Muhammadiyah Purworejo Jurnal Radiasi Vol. 3 No. 1, 2013)

method used is the quantitative research and compare students who were given the treatment and are not given the treatment.[14]

Research conducted by Jesse Wilcox dan Lindsey R. Richeyin the form of a article entitled *"Using Concrete Activities to Confront Misconseptions about Magnetism in The Primary Grades".* The research method used was a researcher of classroom action research. The problems discussed the concrete activity of researchers students experience some material on the misconception magnetism problem. The results of his research that the activities developed by the researchers through the activities students can correct the mistake or misconception concept on force magnet. The similarities in this research is the research conducted at the elementary school, the focus of the material covered in the scope of IPA is a magnet and there is a real activity so that students understand the concept of the truth. The difference in this research are the subject of this activity is direct communication done by the teacher with the question why? What happens if ...? There is no media for student writing experiment results while the textbook developed more researchers to the activities that are guided by teachers in understanding the concept.[15]

Research conducted by Mey Risa Retnowati in the form of a thesis entitled *"Pengembangan Bahan Ajar untuk Meningkatkan Pemahaman Konsep Fotosintesis pada Siswa Kelas V MIN Seduri di Kabupaten Mojokerto".* The research method used was a researcher of Research and Development. The issue

[14] Kt. Puspawati et.al, *Pengaruh Model Pembelajaran Inkuiri Terbimbing Berbantuan Media Konkret terhadap Pemahaman Konsep IPA Siswa Kelas V SD Gugus V Kecamatan Buleleng* (Universitas Pendidikan Ganesha, Jurnal Volume 3, 2013)

[15] Jesse Wilcox dan Lindsey R. Richey, *Using Concrete Activities to Confront Misconseptions about Magnetism in The Primary Grades* (Iowa State University in Ames, 2012)

discussed this there are three researchers (3) as to form of learning materials developed, attractiveness materials, and the difference in students using learning materials with no use of learning materials. The results of his research that there is a significant difference in increasing understanding of the photosynthetic material fifth grade which uses IPA learning materials with increased understanding of the photosynthetic material fifth grade that do not use materials. The similarities in this research is the product development isform of textbook, the goal is to improve the understanding of concepts in students, focus subjects on the IPA of fifth grade. Differences in this study is the focus of the material content of photosynthesis was not on a magnet.[16]

The exposure of reserchers over a previous review summarizes the researchers ended up with create table as follows:

[16]Mey Risa Retnowati, *Pengembangan Bahan Ajar untuk Meningkatkan Pemahaman Konsep Fotosintesis pada Siswa Kelas V MIN Seduri di Kabupaten Mojokerto* (UIN Maulana Malik Ibrahim Malang, Skripsi, 2013)

Table 1.1 Previous Study and Research Originality

No.	Researcher name, Title, Shape researcher (thesis/ journal dll), Publisher dan Year	Problem Formulation	Similarity	Differences	Originality Research
1.	K. Dewi et.al, *Pengembangan Perangkat Pembelajaran IPA Terpadu dengan Setting Inkuiri Terbimbing untuk Meningkatkan Pemahaman Konsep dan Kinerja Ilmiah Siswa*, Jurnal Volume 3, Universitas Pendidikan Ganesha, 2013	1. How is validity of learning devices used? 2. How is the practicality of learning devices? 3. How is effectiveness learning devices?	1. The development done in the sphere of IPA subjects 2. Using methods of research and development 3. Guided Inquiry to improve the understanding of students	1. Research was carried out in junior high school not on elementary school 2. Adapting the model of development Dick and Carey not Borg and Gall 3. Learning Device that was developed in the form of product book student's book and teacher's book	Learning device that will be developed by the researchers was the Student Worksheets experiments on magnetic force of matter. This is based guide inqiury and the goal is to increase the understanding of the concept. Although K. Dewi dkk had previously conducted research development at junior high school however, this research does not contain elements of experiments for elementary school students
2.	Dyah Shinta Damayanti et.al, *Pengembangan Lembar Kerja Siswa (LKS) dengan Pendekatan Inkuiri Terbimbing untuk Mengoptimalkan Kemampuan Berpikir Kritis Peserta Didik pada Materi Listrik Dinamis*	1. How is validity of *LKS* that used? 2. How is interesting LKS for students used? 3. How is worthy LKS used in the learning process?	1. The research method used was a researcher of Research and Development 2. The approach used is guide inquiry 3. Development of learning i.e., Student Worksheets	1. The research doing on Dynamic Electric material not on Magnetism 2. The object of the research is the high school students of grade tenth 3. the purpose of the study was to optimize the ability of critical	Student Worksheets developed based guide inquiry also used by researchers Dyah shinta. Student Worksheets will be developed different with previous researchers that with a Student Worksheets which has been

No.	Researcher name, Title, Shape researcher (thesis/ journal dll), Publisher dan Year	Problem Formulation	Similarity	Differences	Originality Research
	SMA Negeri 3 Purworejo Kelas X Tahun Pelajaran 2012/ 2013, Jurnal Radiasi Vol. 3 No. 1, Universitas Muhammadiyah Purworejo, 2013			thinking students not understanding of concept	developed by Dyah Shinta. Although Student Worksheets well as demanding the students to do experiments however, experiments on electrical material for grade tenth students of senior high school not for students of grade fifth at elementary school
3.	Kt. Puspawati et.al, *Pengaruh Model Pembelajaran Inkuiri Terbimbing Berbantuan Media Konkret terhadap Pemahaman Konsep IPA Siswa Kelas V SD Gugus V Kecamatan Buleleng*, Jurnal Volume 3, Universitas Pendidikan Ganesha, 2013	The problems discussed the differences students who follow the understanding of the concept of guide inquiry learning with IPA using concrete media	1. The scope of subjects 2. The learning model used Guided Inquiry 3. The students of fifth grade.	The method used quantitative research not using research development. Research on Kt. Puspawati et.al just compare students who were given the treatment and are not given the treatment.	KT. Puspawati et.al. researching on the influence model of Guided Inquiry are not doing the research that will be developed such as development researchers.
4.	Jesse Wilcox dan Lindsey R. Richey, *Using Concrete Activities to Confront Misconseptions about*	The problems discussed the concrete activity of students experience some material on the magnetism misconception	1. The research was done in the Elementary school 2. The focus of the material is about	1. Principal activities by Jesse Wilcox and Lindsey is the direct communicatio n done by the teacher with	In the research of Jesse and Lindsey there are no guidelines in the conduct of the activities in increasing the

No.	Researcher name, Title, Shape researcher (thesis/ journal dll), Publisher dan Year	Problem Formulation	Similarity	Differences	Originality Research
	Magnetism in The Primary Grades, Artikel, Iowa State University in Ames, 2012	problem	magnetism 3. There are real activities so that students understand actually the concept	the question why? What happens if ...? 2. There is no media for student writing experiment results or Student Worksheets or guidelines do whereas isStudent Worksheets developed more researchers to the activities that are guided by teachers in understanding the concept 3. The questions and activities students do teachers with direct-questions i.e. directing the students to be able to answer correctly	understanding of students of magnetic force.
5.	Mey Risa Retnowati, *Pengembangan Bahan Ajar untuk Meningkatkan Pemahaman Konsep Fotosintesis pada Siswa Kelas V MIN Seduri di Kabupaten*	1. How is the learning materials developed? 2. How is the product development of interesting materials used in learning IPA on fifth grade? 3. Is there any difference in the	1. The purpose of the creation of learning materials is to improve understanding of concepts for students 2. The focus of the subjects on the IPA subject for	1. The products being developed are not Student Worksheets 2. The material used in the development was photosyntheti c not magnetism material	There is a significant difference in increasing understanding of the photosynthetic material for fifth grade which uses IPA learning materials learnings with

No.	Researcher name, Title, Shape researcher (thesis/ journal dll), Publisher dan Year	Problem Formulation	Similarity	Differences	Originality Research
	Mojokerto, Skripsi, UIN Maulana Malik Ibrahim Malang, 2013	level of understanding of the concept of photosynthesis of students who do not use the materials with students using learning materials developed?	fifith grade	3. Adapting the model of development Dick and Carey not Borg and Gall	increased understanding of the photosynthetic material learnings for fifth grade that do not use materials

Thus the exposure of researchers against the previous research. The product to be developed have never developed before. Researchers will develop a product is Student Worksheet distinct from Student Worksheet existing. The differences on the content, learning methods, materials and activities that students will do.

I. Operational Definition of Key Term

To avoid confusion in understanding or interpreting of terms exist, the researcher give an affirmation and a discussion of the term relating to the title of the study include the following:

1. Development is a process or steps to develop a new products or perfecting existing products
2. Student Worksheet is one of material that already packaged in order to facilitate students in learning
3. Development of the Student Worksheet is a process that systematically in order to develop this product or perfecting existing products with print material
4. IPA is a discipline that discusses symptoms of nature based on the results of experiments, and observations.
5. Curriculum 2013 is the curriculum that contribute to the formation of attitudes, skills, and knowledge.

J. Writing Systematics

Systematic discussion in development research will be discussed into six chapters, each of which are sub-chapter discussion. Chapter I Introduction they

are discussing about the background of the problem, formulation of the problem, the development, the benefits of research, development assumptions, the scope of development, product specifications, originality of research, the definition of the term, and systematic discussion.

Chapter II Literature Review they are study of literature that contains study and theory study consisting of theory. The contains a literature review of previous studies that discuss and study the theory that learning consists of IPA in elementary school, magnetism material overview, development of learning materials, guided inquiry, and understanding the concept.

Chapter III Research Method consist of the methods used to result of Student Worksheets includes the models of developed, developing procedures, validation design Student Worksheets for fifth grade in elementary school, trial design product of Student Worksheets, and data analysis.

Chapter IV Development Result is consist of presenting trial data and data analysis. Presenting trial datai.e. description of the learning materials development and presentation of the results of the data obtained through the expert content test subjects, test expert instructional design teachers, test subjects, and field trials. Data analysis the contains discussion of development Student Worksheets analysis of the development of teaching materials, analysis of the results of validation experts, analysis the level of attractiveness of LKS and analysis of the influence of the use of the materials, analysis of the result validation experts, revision of product, and conclusion of development, and advice.

Chapter V Closing contains is conclusion or revised product assessment and feedback or suggestions.

Bibliography contains references that use researchers to make learning materials to this report that contains the name of the author, book title, city of publication, publisher, and year of publication are arranged alphabetically for easy checking in the paper. The attachment contains the results of research learning devices, instruments used, and the validation of learning materials developed (if required).

CHAPTER II

LITERATURE REVIEW

A. Theoretical Framework

1. The Nature of Natural Science (IPA)

On science teaching, there are several processes that must be followed by the student. Learning science is a name that should pass through the process, so that the process produces a product through their ability to think scientifically[17]. The division in IPA as follows:

a. The Definition of IPA

The Harper Encyclopedia Science in Subiyonto mention natural Science is a science and the composed and systematically supported by formal evidence or by things that can be observed.[18] That includes the physical sciences are astronomy, chemistry, geology, mineralogy, meteorology and physics; While the life science covers biology (anatomy, physiology, zoology, citologi and so on).[19]

IPA can be defined as the study of cause-effect. It is according to Sukarno in Asih and Eka,

> Ilmu adalah pengetahuan yang ilmiah, pengetahuan yang diperoleh secara ilmiah, artinya diperoleh dengan metode ilmiah. Dua sifat utama ilmu adalah rasional, artinya masuk akal, logis, atau dapat diterima akal sehat dan subjektif. Artinya, sesuai dengan objeknya, sesuai dengan kenyataannya,atau sesuai dengan pengamatan. Dengan pengertian ini, IPA

[17] Sulistyorini, *Pembelajaran IPA SekolahDasar*(Yogjakarta: Tiara Wacana 2007), p. 9

[18]Subiyanto, *Pendidikan Ilmu Pengetahuan Alam* (Jakarta: Departemen Pendidikan dan Kebudayaan, 1988), p. 3

[19]Usman Samatowa, *op.cit.*, hlm. 1

dapat diartikan sebagai ilmu yang mempelajari tentang sebab dan akibat kejadian-kejadian yang ada di alam ini. [20]

In general the natural sciences have different characteristics with other science. The knowledge about nature obtained empirically, i.e. observation directly over natural events.[21] The methods used for withdrawal of conclusions based on the facts and the logical thought flow so as to find a definite answer.

The explanation above can be drawn the conclusion that science or natural science is a set of knowledge that has the object and obtained through certain methods.

b. The Function of Science

The study science or natural science have the principal function as follows:

1) Science helps humans think in systematic patterns or put something into something logical and more objective
2) Science can explain the symptoms of nature and the relationship with each other between the natural symptoms
3) Science can be used to predict the symptoms will occur based on the pattern of symptoms of nature studied
4) Science used to control nature and to control it for the benefit of humans
5) Science used to preserve the nature because the knowledge about the contribution of nature.[22]

[20]Asih Widi Wisudawati & Eka Sulistyowati, *Metodologi Pembelajaran IPA* (Jakarta: PT Bumi Aksara, 2014) p. 23

[21] Surjani Wonorahardjo, *Dasar-Dasar Sains Menciptakan Masyarakat Sadar Sains* (Jakarta: Indeks, 2011), p. 12

[22]*Ibid.*, p. 12-14

2. Teaching IPA in Elementary School

a. The Characteristic of Elementary Students

This Student Worksheet is titled Student Worksheet Based Guided Inquiry on Magnetism Matter for Fifth Grade V SD/ MI. The Student Worksheet will be tested on SDN Dinoyo 2 Malang, which is 30 students for the control class and 30 students for the experimental class. The development of LKS is done in accordance with the 2013 curriculum and characteristics of Elementary School or *Sekolah Dasar*(SD). Characteristics of children in SD according to Desmita is,

> "Anak-anak usia sekolah ini memiliki karakteristik yang berbeda dengan anak-anak yang usianya lebih muda. Ia senang bermain, senang bergerak, senang bekerja dalam kelompok, dan senang merasakan atau melakukan sesuatu secara langsung."[23]

Therefore, teachers are expected to develop learning activities that provide direct experience to students. Selection of SDN Dinoyo 2 Malang based on the fact of unavailability of Student Worksheet Magnet Force. In addition, there are some students who experience misconcepstions in magnetic force materials.

b. The Teaching IPA in Elementary School

IPA doesn't always provide answers to all the problems that exist. However, students can find a solution or the solution through trial or experiment did ownself.

Teaching IPA should be carried out in the scientific inquiry to foster the ability to think, work, and be scientific as well as communicate as an important facet of life skills. Thereforelearning IPA onSD emphasizes on granting learning

[23]Desmita, *op.cit.* hlm. 35

experiences directly through the use and development of the scientific process skills and attitudes.[24]

IPA can be arranged and modified based on stages of development cognitive. Science process skills defined by Paolo and Marten in Usman that is,

1) Observe
2) Try to understand is observed
3) Applying new knowledge to foresee what happened
4) Testing predicition under conditions to see if the forecast is correct.[25]

The focus of the program is IPA teaching in SD should be directed to foster the interests and development of the students against their world in which they live. The approach used in the teaching and learning process of IPA among others:

1) The environment approach
2) Science process skills approach
3) Inquiry approach
4) Integreted approach (mostly in SD). [26]

c. Role of Teacher

A teacher's role in implementing the strategies of learning is as learning resources, facilitators, managers, mentors, motivators, demonstator, evaluators, and catalyst as well as the IPA concept controller understood the learners.[27]

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[24]I Gusti Ayu Tri Agustiana & I Nyoman Tika, *Konsep Dasar IPA aspek Fisika dan Kimia* (Yogyakarta: Penerbit Ombak, 2013), p. 258

[25]Usman Samatowa, *op.cit.*, p. 5

[26]*Ibid*,. p. 2

[27]Asih Widi Wisudawati & Eka Sulistyowati, *op.cit*,. p. 11

Specifically in the IPA learning teachers can do so through a simple learning with practical work-based inkuiri, then the teacher has tasks that are more specific. Teachers also have to know the procedures, concepts, and skills students learning.[28]

Teachers should use the students ability to participate in the activities of inquiry. Accordance with the statement of John and Sherry, "Teachers should continually reevaluate students' abilities as they participate in Inquiry, mindful that such experiences support not only scientific conceptual understanding but students Inquiry skills as well."[29]

d. The Scope of IPA in SD

The scope of IPA includes subject matter taught in SD:

1) Living things and life process i.e. human, animal, plant and its interaction with the environment and health
2) Objects or materials, properties and functional, including solid, liquid and gas
3) Energy and the changes include magnets, electricity, light, and simple planes
4) Earth and universe include soil, solar system, and other heavenly bodies.[30]

In accordance with the scope of study, Research and Development of learning materials is devoted on the subject matter of magnetism. Subjects about the style of magnetism are:

1) The Nature of Magnet

[28] Ahmad Susanto, *Teori Belajar dan Pembelajar di Sekolah Dasar* (Jakarta: Prenadamedia Group, 2013), p. 181

[29] John Settlage and Sherry A. Southerland, *Teaching Science to Every Child Using Culture as a Starting Point Second Edition* (New York: Third Avenue, 2012), p. 281

[30] Eneng Khoirunisa, *op.cit.*, p. 10

Based on the nature of magnetism, the objects are grouped into 3 types, i.e:

(a) Ferromagnetic, i.e. the object has the nature of magnetism is strong

(b) Paramagnetic, i.e. the object has the nature of magnetism is weak

(c) Diamagnetic, i.e. the object has not the nature of magnetism

2) The Characteristics of Magnet

Magnets have characteristics that are different with other objects, such as:

(1) Can attract certain metal objects

(2) The biggest difference in the style of drag at the poles

(3) Always point north and South direction when hung free

(4) Have two poles

(5) Attrack if difference pole

(6) Repulsion if same pole

3) Make a Simple Magnet

(a) Magnet can be made by means of rubbing a magnet with uniderectional rubbing

(b) With the flow of electric current

(c) Induction (influensi or induced)

4) Make a Simple Compass

The Magnet inside the compass generally can not demonstrate North-South but somewhat distorted because the layout of the magnetic poles of the Earth are not exactly on the poles of the Earth.

5) Benefits of Magnet

(a) As a compass

(b) As the power plant

(c) Application on electronic tools

e. Basic Competencies in the Curriculum 2013

The Curriculum 2013 is a Curriculum based on character or competence in accordance with the opinion of the E. Mulyasa that,

> Kurikulum 2013 yang berbasis karakter dan kompetensi boleh jadi mendasari pengembangan kemampuan-kemampuan lain. Penguasaan ilmu pengetahuan, dan keahlian tertentu dalam suatu pekerjaan, kemampuan memecahkan masalah dalam kehidupan sehari-hari serta pengembangan aspek-aspek kepribadian dapat dilakukan secara optimal berdasarkan standar kompetensi tertentu.[31]

Based on such statement can be inferred that the mastery of science can support the mastery of the other. On the development of this researcher is Student Worksheet using the Curriculum 2013 as a basis for learning that is developed. The material developed is the Magnetic force of the material on Fifth Grade at semester 2.

Basic Competencies which to base development this Student Worksheet are, 3.4 Recognize simple circuit and magnetic properties as well as its application in daily life; 4.4 Making a simple compass to detect the Earth's magnetic field ; 4.5 Create a simple electromagnet and use it to detect the objects drawn by a magnet

From basic competencies that are taken by researcher, the researcher classifies material that contains only material magnetic force for further use in the development process Student Worksheet.

[31]E. Mulyasa, *Op.cit.*, p. 164

3. Understanding Concept of IPA

The concept of the IPA is requires reasoning and mental processes are strong on learners. The mental process of learners in learning the IPAis the ability to integrate knowledge or cognitive learners scheme composed of attributes in the form of skills and values to study natural phenomena.[32]

One of the applications of cognitive development on the education of IPA is the concept can thrive only when direct experience, predating the introduction of generalization an abstract generalization. This method as opposed to the traditional method which only introduce IPA through verbal communication course.[33]

The process of learning the IPA should be able to notice the pre-conceptions learners. Pre-conceptions students greatly influences the misconception and very important note before carrying out the instruction. Pre-conceptions brought by a student was influenced by a wide variety of ways, one of which is the environment in which a child grows and develops. When in understanding the concepts of the IPA does not influence directly with accompanied with real life then the students will attempt to connect the own IPA concept with what they are by what they encounter in real life.[34]

From the opinions above it can be concluded that the understanding of the concept IPA is the way students understand a concept of IPA that has been obtained through a series of incidents or events that are seen or heard stored in mind.

[32]Asih Widi Wisudawati & Eka Sulistyowati, *op.cit*., p. 10
[33]Usman Samatowa, *op.cit.*, p. 6
[34] Asih Widi Wisudawati dan Eka Sulistyowati, *op.cit.*, p. 234

4. The Concept and Misconception of Magnets

a. The Concept of Magnet

A magnet is an object that can attract other objects such as iron and steel. Megnet has several forms, at least there are 4 types of magnet that we often hear, namely magnetic rods, magnetic needles, magnets and magnetized cylindrical horseshoe-shaped U.[35]

If the magnet rods dropped on the stack contains iron, iron will stick to the magnet but do not end in the Middle due to the nature of magnetism gathering on the ends of a magnet which is usually called the magnetic pole. The reaction of antarkutub magnetic pole is a kind of mutual defends refused and a kind of mutual attraction.[36]

The categorization of objects on the nature of magnetic force composed of Ferromagnetic, Paramagnetic and Diamagnetic. Ferromagnetic objects that can be drawn is strong by magnets such as iron, steel and nickel. Paramagnetic is an object that is pulled by magnets like weak, tin, aluminum and llatinum. Diamagnetic is the nature of things dismissed by magnets such as silver, gold, copper, plastic etc.

There are two types of magnets, namely natural magnet and artificial magnet. There are various ways to create a magnet that is, by way of rubbing a magnet in the same direction, with the flow of electrical current and by induction or electrical. As for how to remove the magnetic properties namely, by way of a

[35]I Gusti Ayu Tri Agustiana & I Nyoman Tika, *op.cit.*, p. 163
[36]*Ibid.*, p. 164

hit with a loud, heated, placed in a coil attached to Alternating Current (AC), and placed with another magnet with its polar opposite.

On the theory of the Earth magnetism the free moving a magnet turns out always putting herself according to the direction North-South. This shows that the surface of the Earth magnetic field and there are styles that affect the magnetic poles. The magnetic north pole is always facing towards the North. This can be explained by the assumed that:

1) At the north pole of the earth there is a magnetic South Pole
2) At the south pole of the erath there is a magnetic north pole
3) The earth is a big magnet with South Pole located at the North Pole and the North is located near the south pole of the erath.[37]

b. Misconception of Magnet

Here are some examples of misconceptions in the magnet is,[38]

1) Large Magnet definitely more powerful than small magnet

Justifications: not all that great magnet more powerful than small magnets. It is proved at trial Jase and Lindsey exemplified by students that the small-sized magnet ring faster than a paper clip attract large magnets such as magnet and a horseshoe magnet or magnet U.[39]

2) All magnets are made of iron

Justifications: There are two types of magnets namely, artificial magnet and natural magnetic. Natural magnets directly retrieved from rocks of the earth

[37] *Ibid.*, hlm. 165-168
[38] Asih Widi Wisudawati dan Eka Sulistyowati, *op.cit.*, p. 239
[39] Jesse Wilcox dan Lindsey R. Richey, *Using Concrete Activities to Confront Misconseptions about Magnetism in The Primary Grades* (Ames: Iowa State University in Ames, 2012), p. 66-67

while the artificial magnets, magnets are made by human beings with materials such as iron, steel or nickel.[40] So, not all of the magnet comes from iron.

3) All metals can be attrack by a magnet

Justifications: not all metals can be attrack by a magnet. The most powerful metal pulled by magnets are ferromagnetic like iron, steel, nickel. Weak metals pulled by a magnet is called a pharamagnetic such as tin, aluminum, platinum. Metal that was rejected by the magnet is called Diamagnetism like silver, gold, copper. Objects that exemplified including metal, but not all of these metals can be attrack by a magnet[41]

4) The Earth's North magnetic pole is handy at the North Pole and the South magnetic pole of the Earth handy at the South Pole of the Earth.

Justifications: there are three theory about magnetism of the Earth that can be described as, (a) on the north pole of the Earth there is a magnetic South Pole, (b) on the South Pole of the Earth there is a magnetic north pole, and (c) Earth is a huge magnet with South Pole located at the North Pole and the North Pole is located near the South Pole of the Earth.[42] The conclusion the Earth pole and location of the magnetic pole of the Earth is different.

5. Guided Inquiry

Inquiry or in the language of Indonesia is defined as (*kegiatan penelitian:* research activities). According to Victor & Kellough in David et.al stated that

[40]I Gusti Ayu Tri Agustiana & I Nyoman Tika, *op.cit.*, p. 163-165
[41]*Ibid.*, p. 165
[42]*Ibid.*, p. 168

"research is a process in answering questions and solving problems based on logical testing over facts and observations"[43]

Inquiry can be expressed as a method of learning that aims to answer questions from students or through directional questions by the teacher. In accordance with the statement of Peter Hudson,"Inquiry learning investigates a science topic through predetermeined questions or aims". [44] This model can change old learning, it is according to Siti and Zuhdan:

> .... model ini menjembatani keadaan transisi dari gaya pengajaran sains konvensional yang masih sangat verbalistis serta minim alat-alat, ke gaya pengajaran sains alternatif yang lebih proporsional bagi hakikat sains dan karakteristik siswa sekolah dasar.[45]

The stages of Inquiry Learning in science or science subjects in primary schools can be grouped into five phases:

a. The activities to formulate questions that can be studied through simple experiments
b. The formulation of hypotheses or make predictions
c. Plan and implement a simple experiment
d. Communicate the results of observations using data and equipment used in simple experiment
e. Summing up the results of observations or experiments that have been done.[46]

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[43] David A. Jacobsen dkk., *Methods for Teaching Metode-Metode Pengajaran Meningkatkan Belajar Siswa TK-SMA* (Yogyakarta: Pustaka Pelajar, 2009), p. 243

[44]Peter Hudson, *Learning to Teach in The Primary School* (New York: United States of America by Cambridge University Press, 2013), p. 133

[45] Siti Fatonah dan Zuhdan K. Prasetyo, *Pembelajaran Sains* (Yogyakarta: Penerbit Ombak, 2014), p. 74

[46]Ahmad Susanto, *op.cit.*, p. 176

To determine the topics in the lesson required a teacher to guide students to develop in question to conduct the evaluation. According to Kindsvatter et.al in Asih and Eka that,

> Terdapat dua macam inkuiri salah satunya adalah *guided inquiry* (penyelidikan terarah), pada tingkat ini peran guru dalam melaksanakan proses pembelajaran dengan penyelidikan sangat besar, guru berperan menentukan topik penelitian yang akan dilakukan, mengembangkan pertanyaan-pertanyaan yang terkait dengan topik yang akan diselidiki, menentukan prosedur atau langkah-langkah yang harus dilakukan peserta didik, membimbing peserta didik dalam menganalisis data, menyediakan *worksheet* yang telah berbentuk kolom-kolom sehingga peserta didik cukup melengkapi dan membantu membuat kesimpulan.[47]

It can be concluded that there are some tasks for teachers in implementing the learning with Guided Inquiry that determine the topic or identify the problem, forming hypotheses, determine the procedures or steps, helping to collect data and analyse it and make a conclusion.

6. The Development of Student Worksheet

a. The Definiton of Student Worksheet

Student Worksheet is one of learning resources developed by teachers. Student Worksheetcan also be developed in accordance with the learning activities and situations faced. In accordance with Sumarni opinion in Endang which defines the learning media is "Learning media as a source of information in the form printed teaching materials/ books, magazines, worksheets and the like can be used to support the learning process in the present process or absorb the subjects."[48]

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[47] Asih Widi Wisudawati dan Eka Sulistyowati, *op.cit*., p. 84

[48]Endang Widjajanti, Kualitas Lembar Kerja Siswa (http://staff.uny.ac.id/ system/files / pengabdian/ endang- widjajanti-lfx-ms-dr/ kualitas-lks. pdf by Endang Widjajanti., accessed 19th Oktober 2016 at 5.40 wib)

In the opinion of Sumarni above Student Worksheet into the the learning media because it contains resources are used to support the learning process. Use of Student Worksheet is expected to add to the learning experience of students. This is according to Das Salirawati,

> Penggunaan LKS diharapkan mampu mengubah kondisi pembelajaran dari yang biasanya guru berperan menentukan "apa yang dipelajari" menjadi "bagaimana menyediakan dan memperkaya pengalaman belajar siswa". Pengalaman belajar siswa dapat diperoleh melalui serangkaian kegiatan untuk mengeksplorasi lingkungan melalui interaksi aktif dengan teman, lingkungan, dan narasumber lain.[49]

Student Worksheet who developed by researchers one of its goals is adding the students learning experience where students get experience, it can be used to understand the basic concepts of magnetism. Student Worksheet consists of two types, namely Student Worksheet Experimental and Student Worksheet Non-Experimental. Student Worksheet Experiment developed is conducting experiments. This is according to Anita and Yayan,

> LKS terdiri dari dua jenis, yaitu LKS eksperimen dan LKS non-eksperimen. LKS eksperimen adalah LKS yang dijadikan pedoman untuk melaksanakan eksperimen dan dapat memuat semua jenis keterampilan proses. LKS non-eksperimen adalah LKS yang dijadikan pedoman untuk memahami konsep atau prinsip tanpa melakukan eksperimen dan hanya memuat keterampilan proses tertentu.[50]

Based on this, then the writer doing research to develop is Student Worksheet Experimental Based Guided Inquiry on the material magnetic force for understanding the concept of students. It can be concluded that the development

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[49]Das Salirawati, *Penyusunan LKS dalam Proses Pembelajaran* (http://staff.uny.ac.id/ sites/ default/ files/ pengabidan/ das-salirawati-msi-dr/19penyusunan-dankegunaan-lks.pdf by Das Salirawati., accessed 19th Oktober 2016 at 5.49 wib)

[50] Anita Marina Maryati dkk, *Lembar Kerja Siswa (LKS) Eksperimen dan Non-Eksperimen Berbasis Inkuiri Terstruktur yang Dikembangkan pada Subpokok Materi Pergeseran Kesetimbangan Kimia*, Prosiding Simposium Nasional Inovasi dan Pembelajaran Sains 2015 (SNIPS 2015) 8 dan 9 Juni 2015, Bandung: Indonesia

of the student worksheet Student Worksheetis the process or how to develop Student Worksheet the already existing in accordance with the basic competencies and objectives that will be achieved in learning.

b. The Principle of Student Worksheet

Some things are also very necessary to be considered in assessing the quality of Student Worksheetare:

1) Picture

A good picture for Student Worksheetis who can convey the message/content of the picture is effectively to the user. High-quality photographic images which may not necessarily be used as an effective Student Worksheet image. Therefore, the more important is the clarity of the message or content of the overall image.

2) The Appearance

Appearance is very important in Student Worksheet. First of all students will be interested in the appearance is Student Worksheet, not its contents. If a is Student Worksheet shown with full words, then there are questions that should be answered by the students, this gives rise to the impression of a saturated so boring and not interesting. When displayed with pictures only, it is not possible because the message/content was not going up. So good is Student Worksheet which has a combination of pictures and writings.

3) The Writing

In making Student Worksheet there are some technical requirements in writing that is,

a) Use the printed letters and do not use latin or roman letters and use rather large bold for topics instead of underlined letters
b) Use no more than ten words in a row
c) Use frames to distinguish command words with student answers
d) Try the ratio of the size of the letters to the size of the picture harmonious.[51]

c. Make a Good Student Worksheet

The use of Student Worksheet is very big role in the learning process, so as if the use of Student Worksheet can replace the position of a teacher. This can be justified, if the Student Worksheet used is a good quality Student Worksheet. Student Worksheetgood if qualified:

1. Didactic Requirement

Student Worksheet as one of the means of learning process must fulfill didactic requirement, meaning that Student Worksheet must follow effective teaching-learning principles, that is:

a) Takes into account individual differences.
b) Pressure on the process of finding concepts.
c) Have variations of stimulus through various media and student activities.
d) Can develop students' social, emotional, moral, and aesthetic communication skills.
e) The learning experience is determined by the personal development goals of students and is not determined by the subject matter material.

2. Construction Requirement

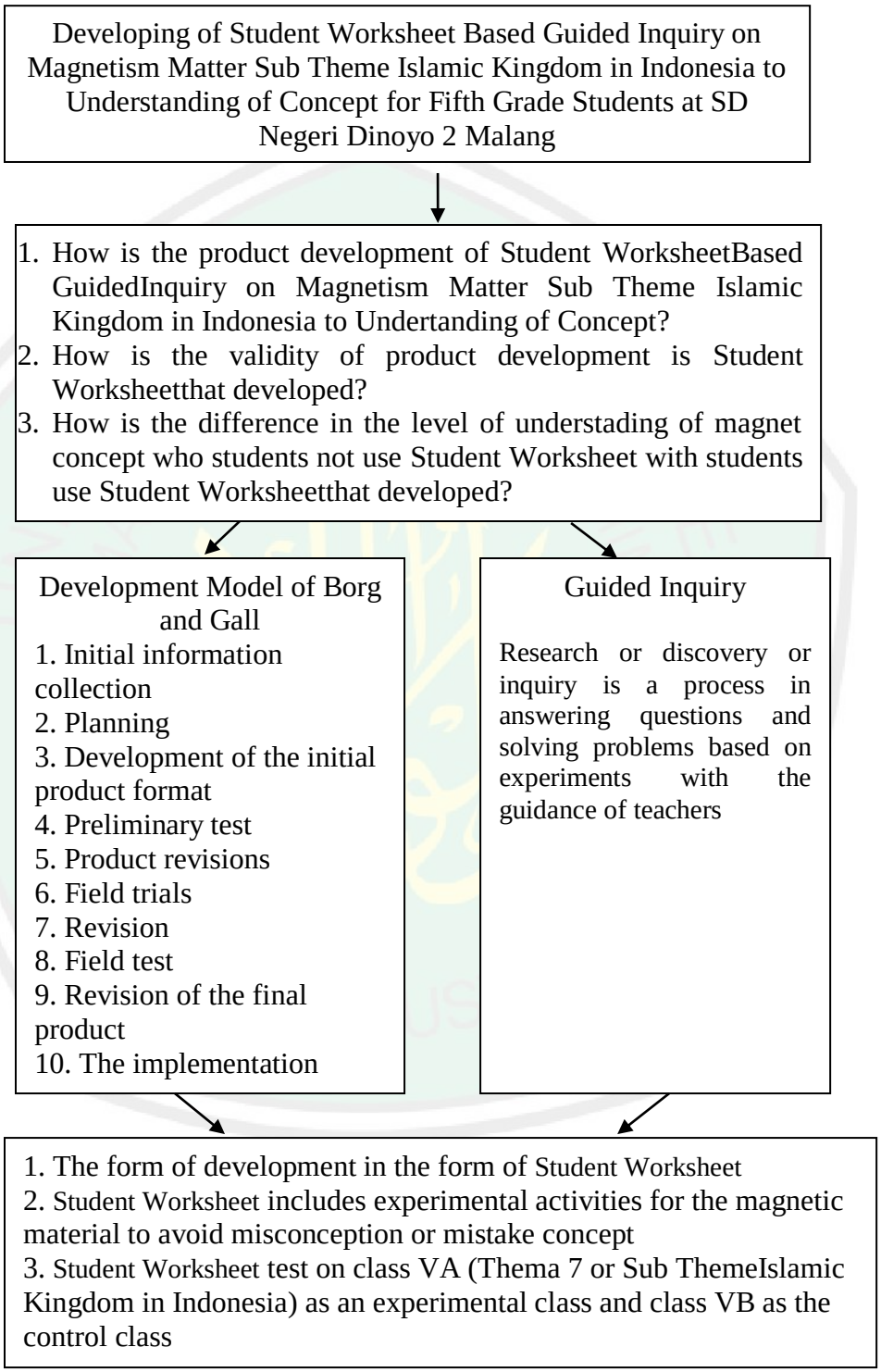
[51]Das Salirawati., *op.cit*, p. 3-5

The terms of construction are the conditions concerning the use of language, sentence arrangement, vocabulary, difficulty level, and clarity which in essence must be appropriate in the sense that can be understood by the user ie the student.

a) Use language appropriate to student maturity level.
b) Using a clear sentence structure.
c) Have a sequence of lessons that match the level of student ability.
d) Avoid open questions.
e) Does not refer to a source book that is beyond the readability of the student.
f) Provide enough room to give students the flexibility to write answers or draw on Student Worksheet.
g) Using simple and short sentences.
h) Uses more illustrations than words.
i) Can be used for all students, both slow and fast.
j) Having a clear learning objective and useful as a source of motivation.
k) Have an identity to facilitate the administration. [52]

[52] *Ibid*, p. 2-3

B. Research Roadmap



Picture 2.1 Research Roadmap

Looking for relevant literature such as the nature of IPA in elementary school. Found some material experiencing misconceptions that occur in students is one of the magnet material. A magnet is an object that can attract other objects such as iron and steel. According to Eka and Asih there is some misconception on magnets such "great magnet is definitely more powerful than a small magnet, the Earth's North magnetic pole is the north pole of the Earth and otherwise, all magnet derived from iron, and all the metal is attrack by a magnet"[53]

The concept of error can be resolved by doing activities to answered misconceptions with a simple activity but still on the guidance of teachers so that students do not misconceptions. To answer the problem misconceptions can be done with Guided Inquiry approach which is a process in answering questions and solving problems based on the discovery with the guidance of teachers.

In this Guided Inquiry teachers and students need a book which contains instructions experiments, the material short and understanding about the concept. This book was developed by researchers in the form of Student Worksheet.

[53]Asih Widi Wisudawati & Eko Sulistyowati, *op.cit.*, 239

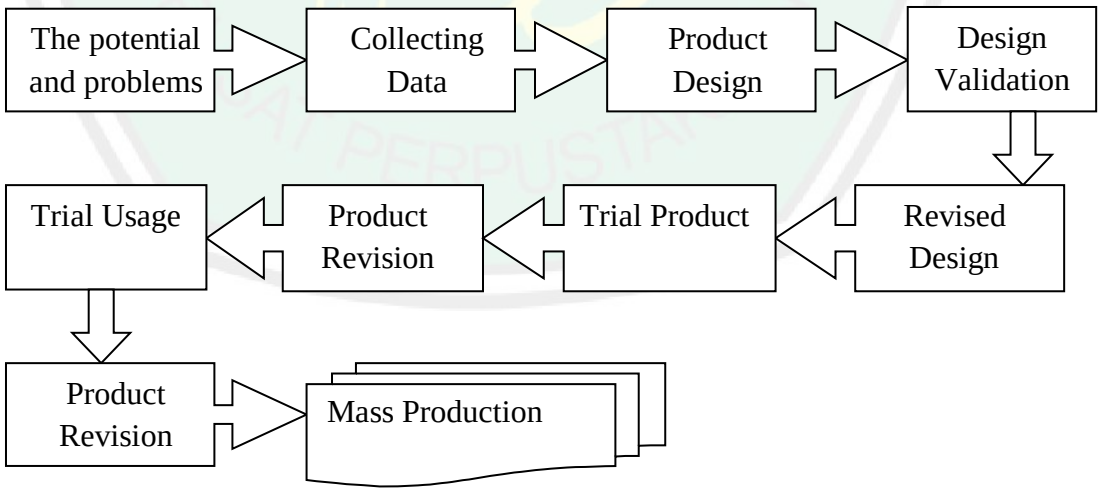
CHAPTER III

RESEARCH METHOD

A. Type of Research

Research carried out the method of research and development is the research methods used to produce a specific product, and test the effectiveness of these products, in order to produce certain products used research that is the needs analysis and to test the effectiveness of these products in order to serve in the wider community, the necessary research to test the effectiveness of these products.[54]

According Sujadi, Research and Development (R&D) is a process or steps to develop a new product, or complete existing products, which can be accounted.[55]



Picture 3.1 Steps for Using the Method Research and Development (R&D)

[54] Sugiyono, *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif dan R&D*, (Bandung: Alfabeta, 2016), p. 407.

[55] Punaji Setyosari, *Metode Penelitian Pendidikan dan Pengembangan*. (Jakarta: Kencana. 2010), p. 194

B. Model of Development

Developing teaching materials necessary preparation and careful planning and careful. The model used in this development is the Reasearch and development of Borg and Gall.

The steps in making development of teaching materials covered in this research through ten stages, among others: [56]

1. Reserchandinformation collection-includes needs assessment, review of literatur, small, -scale research studies, and preparation of report on state of the art.

   Research and information collection includes early literature review, observation or observation class, and the preparation of the initial report. Initial research or analysis very important needs done in order to obtain preliminary information in order to do development.

2. Planning – includes defining skills to be learned, strating and sequencing objectives, identifying learning activities, and small-scale feasibility testing.

   The planning includes finding the specific purpose to determine the sequence of materials and small scale trials. This objective is intended to provide information material on the right to develop a program or product so that it complies with the specific purpose to be achieved.

3. Development premiliminary form of product-includes preparation of instructional materials procedures, and evaluation instruments.

[56]Nusa Putra, *Research & Development Penelitian dan Pengembangan Suatu Pengantar* (Jakarta: PT Raja Grafindo Persada, 2015), p. 119-121

The development of the initial format or the initial draft that includes the preparation of learning materials, handbooks, and evaluation tools. Format the development of product development can be in the form of printed materials such as modules and teaching materials such as textbooks, sequence of processes or procedures in the design of the learning system is equipped with a video or compact disc form.

Draft or initial product developed with the help of experts or people who have skills that are needed. Before the product tested in the field is required evaluations of experts to assess the feasibility of the basics concepts or theories used.

4. Preliminary field testing-cunducted in form 1 to 3 schools, using 6 to 12 subjects. Interview, observasional, and quesioner data collected and analysis.

   The initial trials were conducted on 1-3 schools involving 6-12 subjects and data from interviews, observations and questionnaires were collected and analyzed. Analytical results from early trials be input or revise the initial product.

5. Main product revision-revision of product as suggested by the priliminary field-test result

   Product revision is done based on the results of early trials. Field trial results achieved qualitative information about the program or the product being developed.

6. Main field testing-conducted in 5 to 15 schools with 30-100 subjects. Quantitative data on subjects ‘precourse and postcourse performance are

collected. Result are evaluated with respect to course objectives and are compared with control group data, when appropriate

The revised product based on small scale trial results, then tested again to the unit or the subject of the trial. Field trials conducted against 5-15 school involving 30-100 subjects. Trial results are collected and analyzed. The results of the analysis of the initial trials to do further product revisions.

7. Operational product revision-revision of product as suggested by main field-test result

   Product revision is done based on the results of field trials. The results of the field trials with larger groups or the subject is intended to determine the product's success in achieving the objectives in improving the product for the purposes of repair at a later stage.

8. Operational field testing-conducted in 10-30 schools involving 40 to 200 subjects. Interview, observational, and questionaire data collected and analyzed

   After the product is revised, if developers want products that are more appropriate and adequate, it is necessary to field trials. Field tests involves 10-30 school and involving 40-200 subjects. The trial results are collected and analyzed. Analytical results from early trials to revise the final product.

9. Final product, revision-revision of product as suggested by operational field-test result

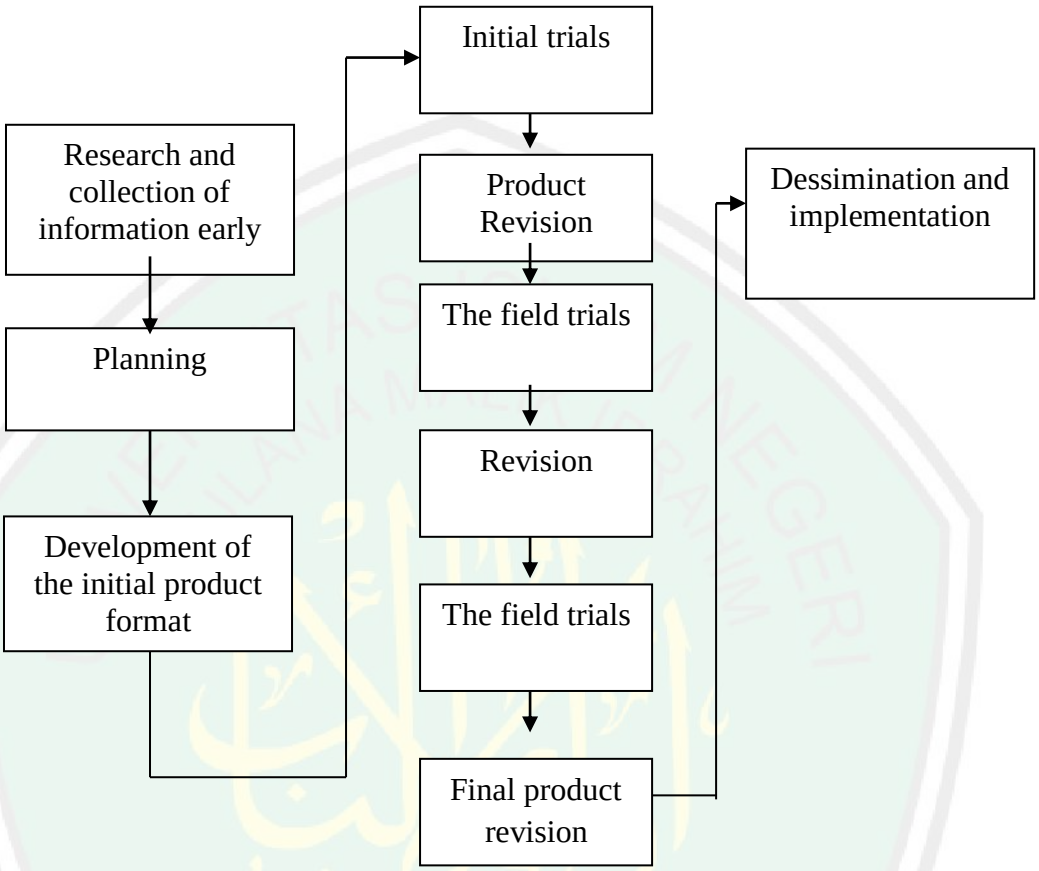
   Revision of product that revision is done by testing a wider field. which is based on the results of field trials. The results of the field trial involving a

larger group or subject matter is intended to determine the product's success in achieving its objectives in improving the product for repair at the next stage.

10. Dessimination and implementation- Report on product at profesional meetings and in journal. Work with publisher who assumes commercial distribution. Monitor distribution to provide quality control.

    Dissemination and implementation of the development that is delivered to the user through forums or in the form of books or handbooks.

Based on the development steps Borg and Gall above can be described as follows:

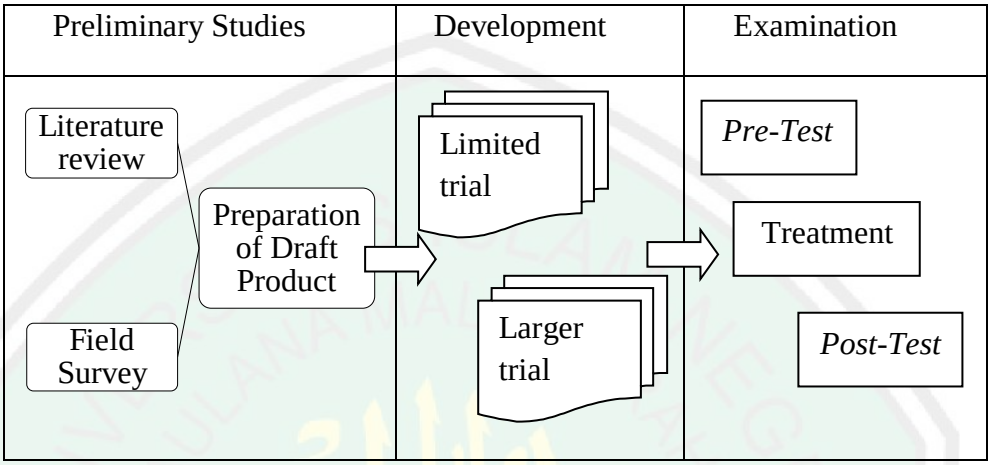


Picture 3.2 Stages Development of Borg and Gall

Research and development of modified has been done by Sukmadinata et al 1996 to 2002 to implement three studies *RUT* and *Hibah Pasca*. Through the research conducted modification implementation measures of research and development: 1) A preliminary study which includes literature studies, field studies, and the drafting of the initial product, 2) testing the limited sample (limited trial) and trials with samples wider (trial wider), 3) test the product is through experiment and socialization of results.[57]

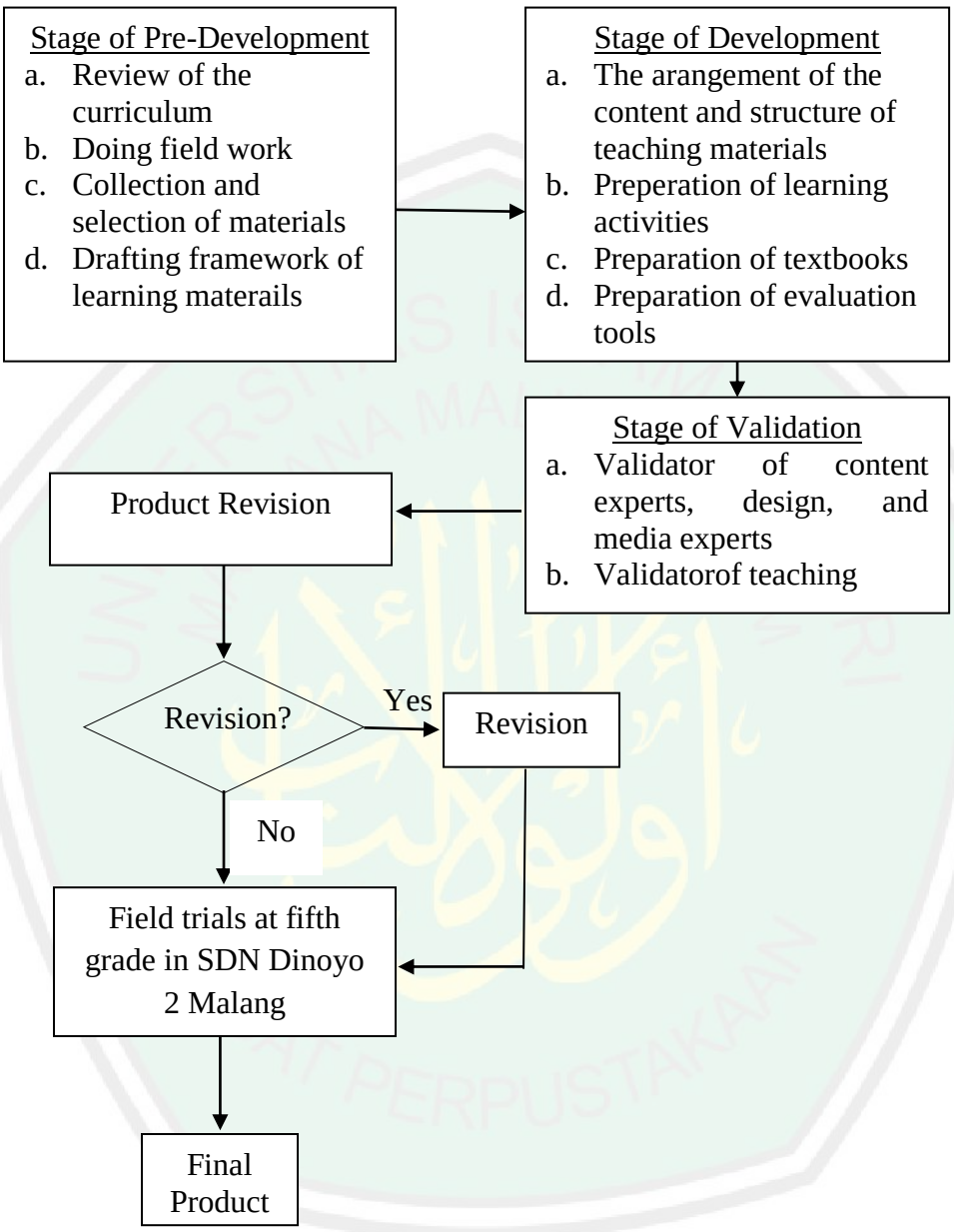
[57] Prof. Dr. Nana Syaodih Sukmadinata, *Metode Penelitian Pendidikan* (Bandung: PT Remaja Rosdakarya. 2011), hlm. 190

Visually measures modified research and development can be seen as follows:



Picture 3.3 Steps Borg and Gall Development that has been Modified

From the model research conducted Borg and Gall, the researchers adapted it as follows: (1) pre-development stage, (2) phase of product development, (3) the test phase of the product, and (4) the stage of revision. The following charts the development of adaptation are:



Picture 3.4 Stages of Developing Student Worksheet

C. The Procedure of Development

Based on the research model Borg and Gall, procedures or steps taken by the researcher through four stages, a) pre-development stage, b) the product development stage, c) the validation and revision, and d) field testing stage:

1. Stage of Pre-Development Product

The purpose of this stage of pre-development i.e. learn and explore the characteristics of the material which was developed into the planned student worksheet. In addition, to collect materials the materials needed for designing learning materials. Activities performed in this stage are:

1) Review of the Curriculum

Analysis of the curriculum implemented aims to define the basic competencies. At this stage determined the number of basic competencies that would be developed into the Student Worksheet. As for the basic competencies selected are of magnetic force. The selected Basic Competencies are as follows:

Tabel 3.1

Basic Competencies and Indicators

Basic Competencies	Indicator
3.4 Recognize simple circuit and magnetic properties as well as its application in daily life	1. Students can understand the nature and characteristics of the magnet 2. Students can identify the benefits of magnets in daily life
4.4 Making a simple compass to detect the Earth's magnetic field	1. Students can make a simple compass to determine the direction of the earth 2. Students can use a simple compass 3. Students can specify the direction of the wind by using a simple compass
4.5 Create a simple electromagnet and use it to detect the objects drawn by a magnet	1. Students can make simple magnet

2) Doing Fieldwork

Fieldwork were carried out aiming to identify the behavior and characteristics of the Fifth Grade students of Elementary and analyze the needs of Student Worksheet of magnetic force. This activity is carried out by means of

interviews with classroom teachers and observe the textbooks and Student Worksheetused in teaching IPAespecially in magnetic force material.

The results of observations show that the textbooks of natural science, especially learning the magnetic force is already referring to the curriculum in 2013, only less varied so impressed saturating students and monotonous. In addition, due to the lack of studentsactivities in support of the material being taught consequently many students who have misconceptions.

3) Collection and Selection of Materails

At this stage, carried out the collection and selection of materials used in the development of Student Worksheet. Student Worksheetselected adapted to the needs of SD. The results of that process will be material with respect to the magnetic force learning in Student Worksheetdeveloped.

4) Preparation of Student Worksheet framework

Student Worksheetdrafting the framework for categorizing indicators, material, step experiment, evaluation of Basic Competence.

2. Stage of Product Development

At this stage, conducted experiments based Student Worksheet development. In developing this material, researchers conducted a consultation with subject teachers and some of the competent authorities in the field of natural sciences. The material presented in this Student Worksheet is a matter of experimentation to understand students concept of magnetic force. The material's magnetic force in Student Worksheet written by adding activitiesbasedGuided Inquiry experiments. The series of processes is as

follows: (1) to the arrangement of the content and structure LKS, (2) the preparation of learning activities, (3) the preparation of worksheets with the addition of experimental activities, and (4) preparation of evaluation tools.

3. The Stage of Trial Products

The activities at this stage to determine the feasibility level of early drafts resulting from development stage so that it can be improved to improve products in the form of worksheets. In the test phase, there are two steps, namely product validation stage and phase of field trials. Validation of products made in consultation with the expert group, ie materials experts, design expert and media expert, and teacher.

Student Worksheet eligibility was further validated by Agus Mukti Wibowo, M.Pd as matter experts for the magnetic force,Ahmad Abtokhi, M.Pd, as design expert, Muh. Zuhdi Hamzah, S.S, M.Pd as a linguist and Nunik Martin Lestari, S.Pd as a teacher. Aspects assessed by expert lecturers and media design are LKS display, presentation and layout design. Aspects assessed by lecturers matter experts that the contents of LKS conformity with existing concepts. While aspects of linguists is assessed the suitability of the language used by the development of learners. For syntax validation in the form of feasibility Lesson Plan or *Rencana Pelaksana Pembelajaran*(RPP) carried out by the class teacher RPP VA SDN Dinoyo 2 Malang.

The results of the validation assessment experts and practitioners used to improve products. After that, the field trials conducted to determine the feasibility of worksheets that have been developed.

4. Stage of Product Revision

This activity is carried out for repairs or improvements to the initial draft based on an analysis of data or information obtained from experts and students. If Student Worksheet has been said to be valid, the researchers did not need to be revised and the product is ready to be implemented, but if Student Worksheet not be valid it must be revised prior to the final product development.

D. Trial Products

Product trials intended to collect data that can be used as the basis for establishing the validity, effectiveness and attractiveness of the product. In this section will be presented in a sequence trail design, trial subjects, types of data, data collection instruments and technical analysis of the data.

1. Test Design

The stage was carried out in the development of this was the stage of consultation, expert validation phase, as well as the stage of field trials. Each stage is described as follows:

a) Stage of Consultation

The consultation stage consist of several activities i.e:

1) Supervisor to check the Student Worksheet developed. Lecturers provide guidance and suggestions for improvements Student Worksheet less.
2) Researchers make improvements Student Worksheet based on the results of the consultations conducted

b) Stage of Expert Validation

In this stage there are some of the activities carried out include:

1) The materials experts, design experts, linguist expert and teacher provide comments and suggestions on the teaching materials produced.

The validator in the development of student worksheet *(LKS)* based guided inquiry on the subjects of IPA of magnetic force material are materials experts, design experts, linguist expert and teacherSDN Dinoyo 2 Malang. Selection SDN Dinoyo 2 Malang as test sites based on several reasons, i.e (1) students had misconceptions on the material magnetic forceand (2) lack of LKS experiment companion textbooks.

a) Material Experts

The material experts are lecturers who are experts in mastering the material magnetic force. The qualified experts in the development of this research is someone who at least:

(1) Having knowledge and experience relevant to the products developed

(2) Mastering the material characteristics IPA in SD/ MI in particular the magnetic force

(3) Willing to test the product development material experts, design experts, linguist expert and teacherbased Guided Inquiry in science subjects

b) Design Experts

Design and learning media expert is set as the test design Student Worksheet Based Guided Inquiry. Selection of design experts and the media is based on the consideration that possess competence in the field of design Student Worksheet.Design experts provide comments and suggestions to the attractiveness of the Student Worksheet.

c) Linguist Expert

The linguist experts are lecturers who are experts in mastering grammar. Linguist experts provide comments and suggestions grammar of the Student Worksheet.

d) Teacher

Teachers provide feedback and assessment of the development Student Worksheeton Magnetism Matter Based Guided Inquiry the material. The criteria for fifth grade teacher is as follows:

(1) The teacher was teaching institution level SD/ MI

(2) Have experience in teaching science.

(3) The willingness of the science teacher as assessor and the product development for the data acquisition source development results.

2) Researcher analyzing assessment data in the form of comments and suggestions for improvement.

3) Developers make improvements instructional materials science based assessment and responses given.

The validation results obtained through assessment and feedback from the experts to complete a questionnaire and provide feedback or suggestions to the instructional materials used to determine the feasibility of teaching materials for use in learning.

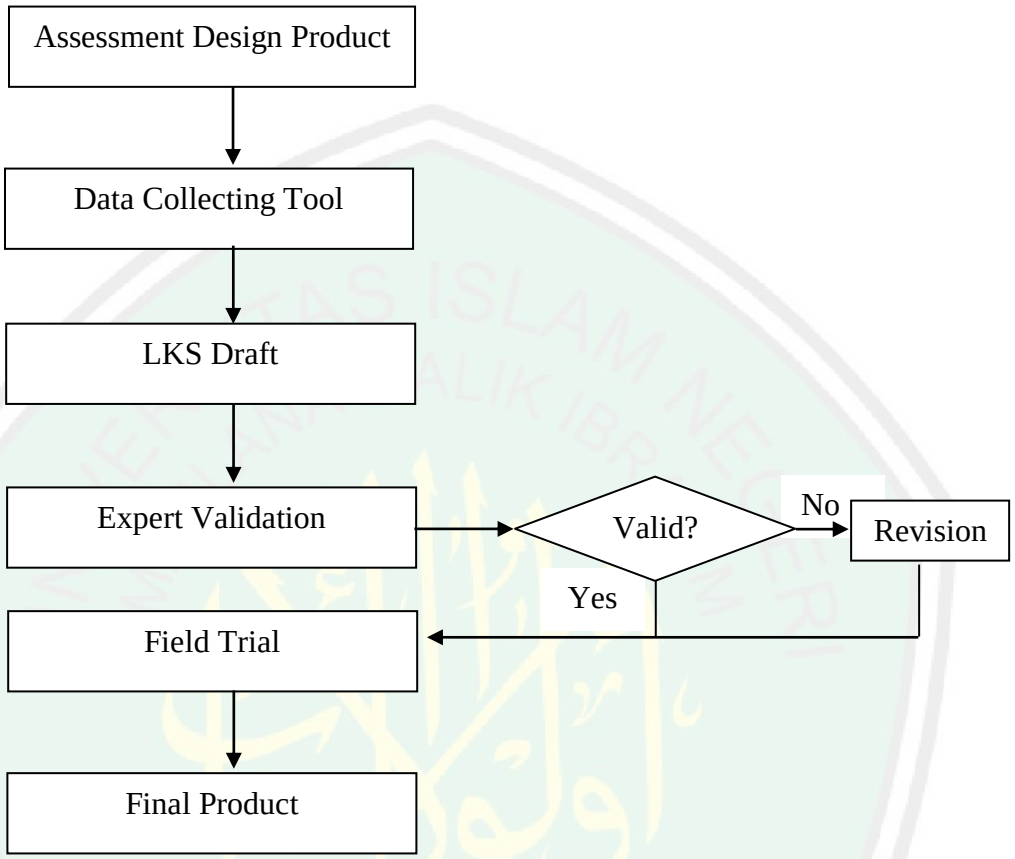
c) Stage of Field Trial

Field trials carried out on students of fifth grade in SDN Dinoyo 2 Malang consisting of some of the following activities:

1) Researcher observe students during the learning process materials using magnetic force of Student Worksheet
2) Students give an assessment for Student Worksheetdevelopment results
3) Researcher doing data analysis research
4) Researcher make improvements Student Worksheetbased on the analysis of ratings

Stage of field trials conducted on the students of SDN Dinoyo 2 Malang, utilization of Student Worksheet for primary school students at fifth grade in the material magnetic force. Furthermore, the design of the product ratings can generally be described in the following figure[58]

[58]Izza Ma'uzi Azizah, "Pengembangan Bahan Ajar Berbasis Multimedia Interaktif untuk Meningkatkan hasil Belajar pada Mata Pelajaran Ilmu Pengetahuan Alam Materi Rangka Manusia Kelas IV MIN Cengok Ngronggot Nganjuk", *Skripsi* tidak diterbitkan, PGMI Fakultas Ilmu Tarbiyah dan Keguruan UIN Malang, 2013, p. 44



Picture 3.5 Trial Product Design

2. Subject Trial

The field trials were taken from students of class V A SDN Dinoyo 2 Malang from 2016/2017 totaling 30 students as an experimental class and class V B students from 2016/2017 totaling 30 students as the control class.

3. Types of Data

The type of data in the research development of teaching materials in the form of quantitative and qualitative data. According Sugiyono qualitative data is

the data that appears tangible words and not a series of numbers.[59] Qualitative data collection is generally in the form of the following activities: (a) Interviews and consultation with experts and teachers teaching science fifth grade in SDN Dinoyo 2 Malang of opinion feelings and knowledge and (b) Documentation, in the form of the results of students in the learning before and sources writing, notes and so on.

Quantitative data is data in the form of numbers or qualitative data be scoring. Quantitative data obtained from the assessment results validate the product, in the form of scores contained on assessment questionnaire.

4. Data Collection Instruments

a) Questionnaire

Questionnaire created containing a list of of questions used to obtain information or feedback from expert lecturers and science teachers. The contents of the questionnaire form of questions relating to the content or the state of development components of Student Worksheet for fifth grade that has been produced. Information or responses obtained, then the revision of Student Worksheet. Questionnaires were also given to the students to determine the attractiveness and expediency on worksheets that have been developed.

The questionnaire is required as follows:

1) Questionnaire responses ratings or content expert of Student Worksheet

[59]Lexy J. Moleong, *Metodologi Penelitian Kualitatif Edisi Revisi* (Bandung: PT Remaja Rosdakarya Bandung, 2015), hlm. 35

Table 3.2 Gratings Sheet for Content Expert of Student Worksheet

No.	Aspects of Assessment	Criteria	Item Number
1.	Teaching	The suitability of indicators, objectives, and material learning with Based Competences/ *KD*	2
2.	Material	Completeness of the material	2
		Accuracy material	2
		The suitability of evaluation	2
		The suitability of linguist	1
		The suitability of experiment	1
Totals			12

2) Questionnaire response assessment or instructional design experts

Table 3.3Gratings Sheet for Design Expert of Student Worksheet

No.	Aspects of Assessment	Criteria	Item Number
1.	Display	The suitability of cover Design	1
		The suitability of font and type	2
		The suitability of picture	5
		The suitability of color consistent	1
		The suitability of layout	1
Totals			10

3) Questionnaire response assessment or instructional linguist experts

Table 3.4Gratings Sheet for Linguist Expert of Student Worksheet

No.	Aspects of Assessment	Criteria	Item Number
1.	Language	The suitability language of cover	2
		The suitability language of materials	2
		The suitability language of experiments	1
		The suitability language of evaluation	5
Totals			10

4) Questionnaire assessments or student feedback through field trials

Table 3.5 Gratings Sheet for Student Feedback ofStudent Worksheet

No.	Aspects of Assessment	Criteria	Item Number
1.	Comprehension	Language, word/ phrase in *LKS* easily understood	3
		The material is easy to understand	5
2.	Layout and Interaction quality	Cover, main menu, background, color, textand images display	2
Totals			10

5) Questionnaire responses assessment for teacher in class V SDN Dinoyo 2 Malang.

Table 3.6 Gratings Sheet for Teacher Class Feedback of Student Worksheet

No.	Aspects of Assessment	Criteria	Item Number
1.	Display	Display quality	1
		The material is easy to understand	3
2.	Materials	The suitability indicators with KD	1
		Serving materials techniques	2
		The suitability of evaluation	2
3.	Language	The suitability of language	1
Totals			10

The scale used in the assessment questionnaire in was a *Likert scale*. The scoring criteria used developers in giving assessments on Student Worksheet developed are:

Table 3.7 Questionnaire Assessment

Answer	Description	Score
SS	Very suitable	4
S	Suitable	3
TS	Not suitable	2
STS	Very not suitable	1

b) Interview Guide

The interview is a conversation with a specific purpose. The conversation was conducted by the two parties, namely interviewer that providing questions and interviewees which provides answers to the questions.[60]

On the research of the development of this interview conducted by teacher in class VA. Interviews can be done personally by preparing in advance guidance interview. Interview guidelines contain points of discussion, but at the time of the interview done things the subject matter can be developed.

The interview guide used by the researchers to determine the existing problems in the magnetic force are as follows:

1) The need for teaching materials.
2) The level of understanding of students during the learning
3) The difficulties faced by teachers

From interviews over researchers trying to design a teaching materialsbased Guided Inquiry to improve learning students outcomes for magnet force.

5. Data Analysis Techniques

There are three data analsis technique that is used to process data analysis i.e. development results of contents, descriptive analysis and data analysis of test results.

[60] *Ibid.*, hlm. 186

a) Content Analysis of Teaching

This analysis conducted by clustering analyzes to formulate learning objectives based on basic competencies and organizing learning content that is developed. The results of this analysis is then used for the development of Student Worksheetto improve students understanding of the concept of magnetic force.

b) Descriptive Analysis

At this stage of the trial, the data collected using a enclosed assessment questionnaire and open assessment to provide feedback, suggestions, feedback improvements.Descriptive analysis was used to determine the level of accuracy, effectiveness and attractiveness of the product development results in the form of Student Worksheet based Guided Inquiry in class V.

The collected data can be grouped according to the type of data and are grouped into two kinds, namely: quantitative data in the form of numbers and qualitative data in the form of words or symbols.

While the numerical data or quantitative data obtained from the count validation questionnaire. The formula for calculating the results of the validation questionnaire assessment is as follows:

$$P = \frac{\sum X}{\sum Xi} \text{ x } 100\%$$

Informations :

P = Percentage

$\sum x$ = Amount of answer ratings

$\sum x_i$ = Amount ultimate answer[61]

Student Worksheet developed can be found worthy in achieving the criteria at least 75. If the minimum criteria is reached then the IPA teaching materials can be said to have been valid and can be utilized in the process of teaching and learning. To derive the conclusion from that reached by the then established the following criteria.[62]

Table 3.8

Eligibility Criteria Materials

Persentase (%)	Level of validity	Description
80 < skor ≤ 100	Valid	Not Revised
60 < skor ≤ 80	Quite Valid	Not Revised
40 < skor ≤ 60	Less Valid	Most Revision
20%< skor ≤ 40	Invalid	Revisision Total

Description eligibity criteria table:

1) If the Student Worksheet that validated reached a level percentage 80%<skor≤100%, Student Worksheet are classified as valid qualifications.
2) If a validated Student Worksheet reached a level percentage 60%<skor≤80%, Student Worksheet are classified qualification is valid
3) If a validated Student Worksheet reached a level percentage 40%<skor≤60%, Student Worksheet are classified as less valid qualifications.
4) If the Student Worksheet that validated reached a level percentage 20%<skor≤40%, Student Worksheet are classified qualification is not valid.

c) Data analysis of Test Result

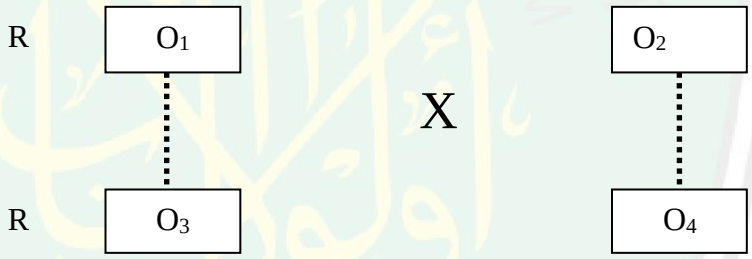
[61] Suharsimi Arikunto, *Dasar-dasar Evaluasi Pendidikan*, (Jakarta: Bumi Aksara, 2006) p. 112

[62] Subali, dkk.*Pengembangan CD Pembelajaran Lagu Anak untuk Menumbuhkan Pemahaman SAINS Siswa Sekolah Dasar*. Jurnal PGSD Universitas Negeri Surabaya.2012

After revision of the worksheets that developed the next stage of testing products to students. The study involved two classes of samples, the design of the study is a Pretest-Posttest Control Group Design.

This test conducting by compare the experiment class and control class, with the A class as the experiment class get treatment of teachers in Student Worksheet. While students in B class as the control class do not be used treatment as the comparison. Model of Control-Experiment test can be described as the following.

Briefly the draft of this research can be described in the design as follows.



Picture 3.6 Pre-test Post-Test Group Design

Based on the picture above can be explained that before Student Worksheet tested, then the students are divided into two groups or classes that is the experiment class which amounted to 30 students and control class which amounted to 30 students. With description:

O_1 : pre-test experiment class

O_3 : pre-test control class

O_3 : post-test experiment class

O_4 : post-test control class

X : treatment

R : Experimental and control group retrieval is done randomly

1) Subject Trial

The research subject of this development is the class VA and VB SDN Dinoyo 2 Malang, the amount of subject of research were 60 students.

2) Type of Data

The type of data on product trials Student Worksheet are in the form of quantitative data results and posttest scores prettest done. Prettest done before treatment is given in the form of teaching materials and posttest scores performed after the treatment is given in the form of teaching materials developed.

3) Data Collection Instruments

This research uses the instrument in the form of the test i.e. the prettest and posttest. The test was a spate of questions or exercises as well as other tools that are used to measure the skill, knowledge, ability, intelligence or talent that are owned by individuals or groups.[63] Research development of test instruments using that contain a number of questions, is used to find out the difference of level of understanding of students before and after giving Student Worksheet.

4) Data Analysis Techniques

Post-test data were analyzed by using t-test to determine the significance of improved learning outcomes between experimental classes (classes using Student Worksheet that had been designed) with control classes (classes using

[63] Suharsimi, Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: Rineka Cipta, 2006, hlm, 150

teaching materials from schools). t-test formula with significance level of 0.05 as follows:[64]

$$t = \frac{\bar{X}_I - \bar{X}_2}{dsg\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Informations :

$\bar{X}1$: average sample 1 (experiment class)

$\bar{X}2$: average sample 2 (control class)

dsg : standard combined deviation value

n_1 : many of the group 1

n_2 : many of the group

[64] Subana dkk, *Statistik Pendidikan*, (Bandung: Pustaka Setia, 2000), hlm. 171-173.

CHAPTER IV

DEVELOPMENT RESULT

A. Presenting Trial Data

1. Description Student Worksheet

The result of the development of products that are developed in the form of Student Sub Theme Islamic kingdom in Indonesia Based Guided Inquiry to improve the understanding of the concept of fifth grade students of SDN Dinoyo 2 Malang. The description of the product student worksheets are as follows:

a. Product identity

Physical Form: printed material

Title: *Lembar Kerja Siswa (LKS) Gaya Magnet Berbasis Inkuiri Terbimbing*

Goal: Students in fifth grade SDN Dinoyo 2 Malang

Author Name: Niken Farida Hanum

Thickness of Pages: 25 pages

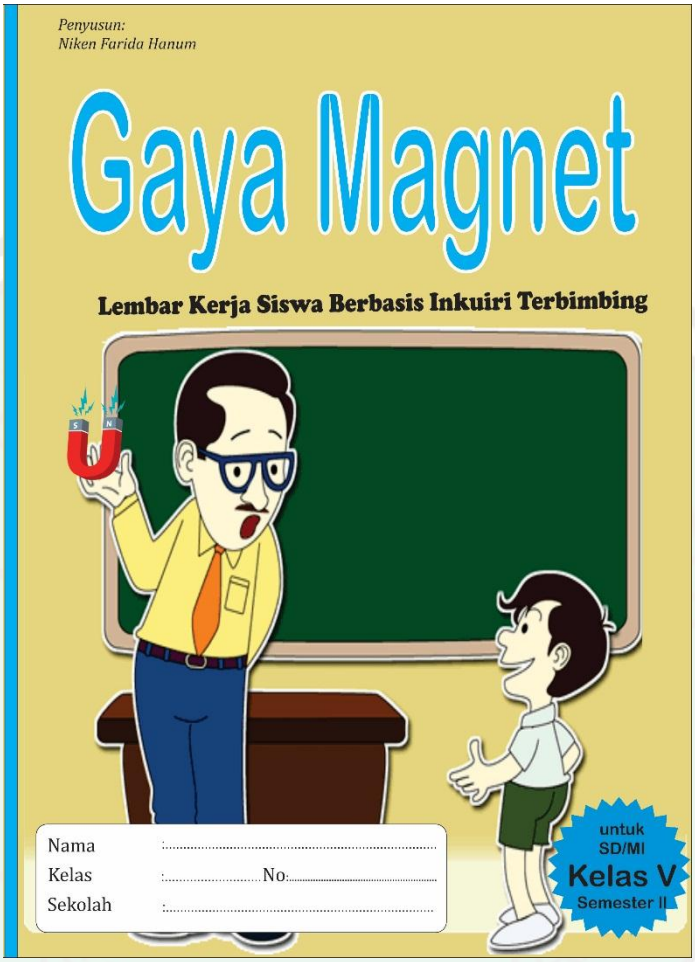
Edition: First

Paper Size: A4 (210 mm x 297 mm)

b. Book cover

Cover material in student worksheet (LKS has two parts: the front cover and back cover. The explanation i.e:

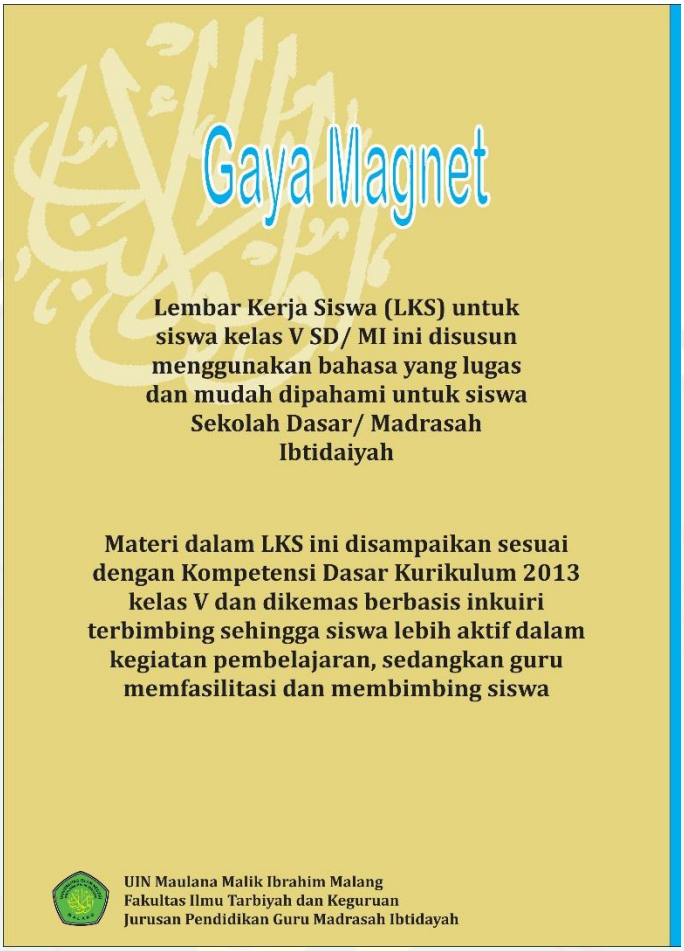
1) Front Cover



Picture 4.1 Front Cover

The front cover Student Worksheet consists of book titles adapted to the subject being developed entitled "Gaya Magnet Lembar Kerja Siswa Berbasis Inkuiri Terbimbing", the curriculum used by this Student Worksheets that the Curriculum in 2013, grade levels, and the name of the developer. While the background of books adapted to the material covered in the book is the magnetic force, It aims to make the reader is able to know the meaning of the title before opening the contents of the students worksheets.

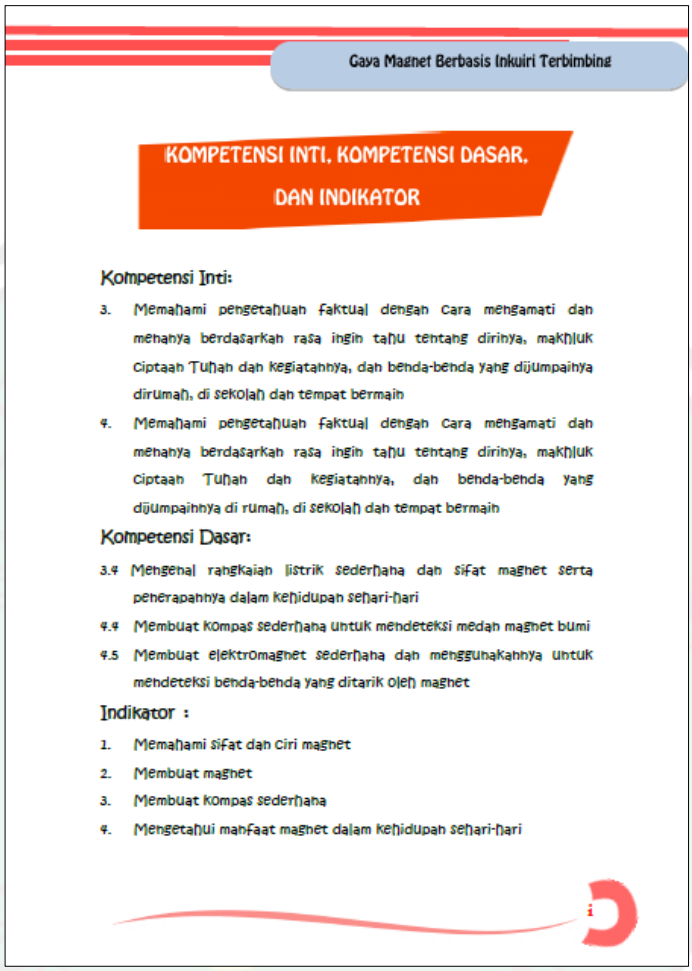
2) Back Cover



Picture 4.2 Back Cover

The back cover has a short description of the contents of Student Worksheet. On the back cover there is also a logo UIN Maulana Malik Ibrahim Malang.

3) Core Competences and Basic Competences



Gaya Magnet Berbasis Inkuiri Terbimbing

KOMPETENSI INTI, KOMPETENSI DASAR, DAN INDIKATOR

Kompetensi Inti:

3. Memahami pengetahuan faktual dengan cara mengamati dan menanya berdasarkan rasa ingin tahu tentang dirinya, makhluk ciptaan Tuhan dan kegiatannya, dan benda-benda yang dijumpainya dirumah, di sekolah dan tempat bermain
4. Memahami pengetahuan faktual dengan cara mengamati dan menanya berdasarkan rasa ingin tahu tentang dirinya, makhluk ciptaan Tuhan dan kegiatannya, dan benda-benda yang dijumpainnya di rumah, di sekolah dan tempat bermain

Kompetensi Dasar:

3.4 Mengenal rangkaian listrik sederhana dan sifat magnet serta penerapannya dalam kehidupan sehari-hari

4.4 Membuat kompas sederhana untuk mendeteksi medan magnet bumi

4.5 Membuat elektromagnet sederhana dan menggunakannya untuk mendeteksi benda-benda yang ditarik oleh magnet

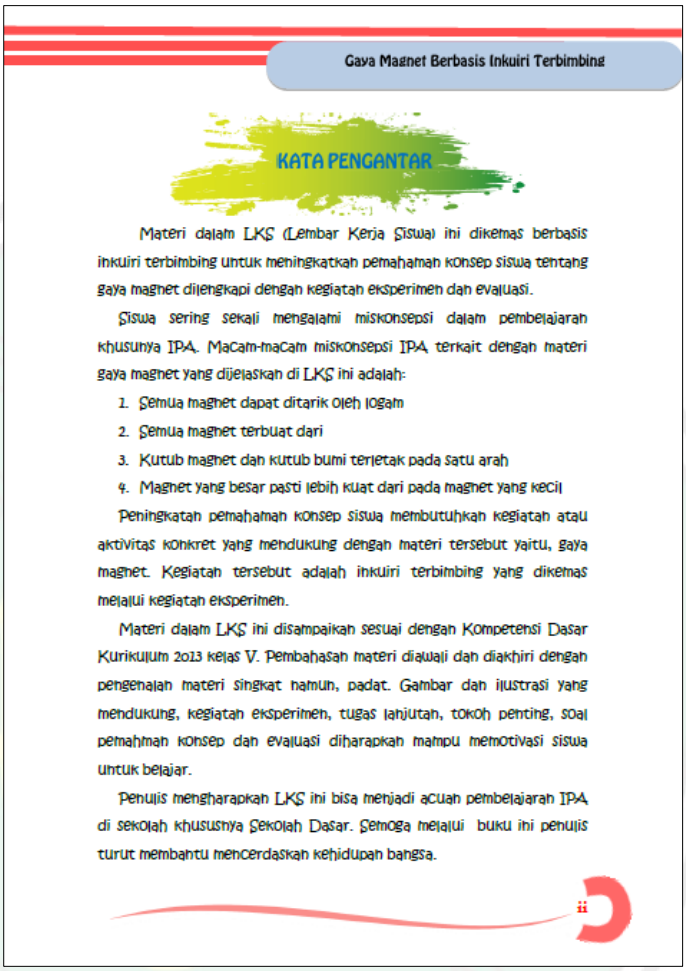
Indikator :

1. Memahami sifat dan ciri magnet
2. Membuat magnet
3. Membuat kompas sederhana
4. Mengetahui manfaat magnet dalam kehidupan sehari-hari

Picture 4.3 Core Competences, Basic Competences and Indicators

Core Competence and Basic Competence that have been written in the student worksheet intended to ease teachers and students in learning Magnetism Matter. It proves that the content of Student Worksheet is not out of the core competence and basic competences in the Curriculum, 2013.

4) Preface



Gaya Magnet Berbasis Inkuiri Terbimbing

KATA PENGANTAR

Materi dalam LKS (Lembar Kerja Siswa) ini dikemas berbasis inkuiri terbimbing untuk meningkatkan pemahaman konsep siswa tentang gaya magnet dilengkapi dengan kegiatan eksperimen dan evaluasi.

Siswa sering sekali mengalami miskonsepsi dalam pembelajaran khususnya IPA. Macam-macam miskonsepsi IPA terkait dengan materi gaya magnet yang dijelaskan di LKS ini adalah:

1. Semua magnet dapat ditarik oleh logam
2. Semua magnet terbuat dari
3. Kutub magnet dan kutub bumi terletak pada satu arah
4. Magnet yang besar pasti lebih kuat dari pada magnet yang kecil

Peningkatan pemahaman konsep siswa membutuhkan kegiatan atau aktivitas konkret yang mendukung dengan materi tersebut yaitu, gaya magnet. Kegiatan tersebut adalah inkuiri terbimbing yang dikemas melalui kegiatan eksperimen.

Materi dalam LKS ini disampaikan sesuai dengan Kompetensi Dasar Kurikulum 2013 kelas V. Pembahasan materi diawali dan diakhiri dengan pengenalan materi singkat namun, padat. Gambar dan ilustrasi yang mendukung, kegiatan eksperimen, tugas lanjutan, tokoh penting, soal pemahman konsep dan evaluasi diharapkan mampu memotivasi siswa untuk belajar.

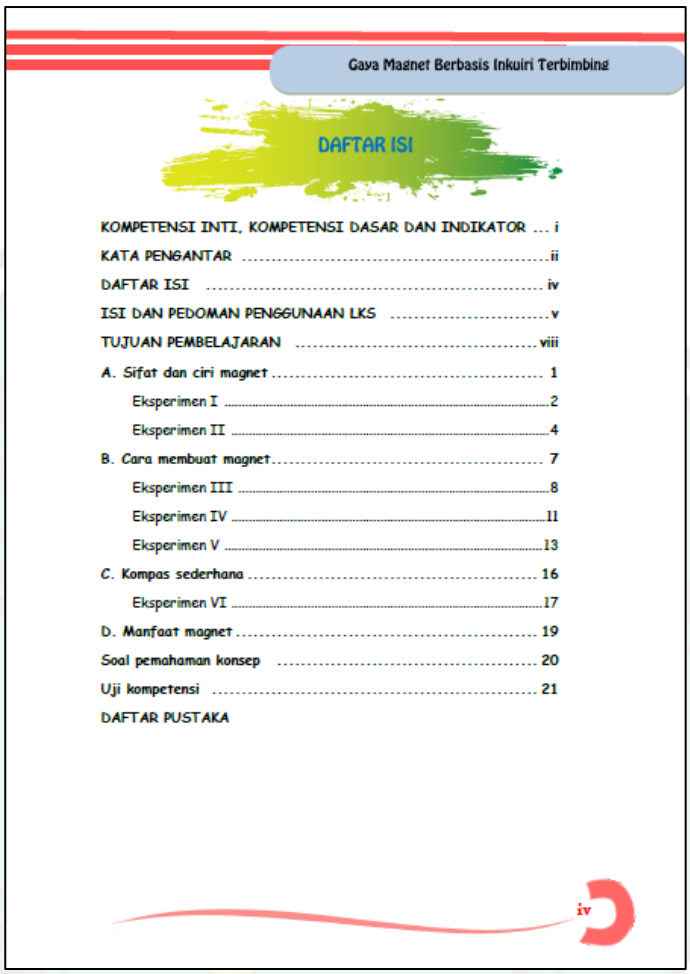
Penulis mengharapkan LKS ini bisa menjadi acuan pembelajaran IPA di sekolah khususnya Sekolah Dasar. Semoga melalui buku ini penulis turut membantu mencerdaskan kehidupan bangsa.

ii

Picture 4.4 Preface

The contents of the preface is an effort writers to communicate with the reader, by applying several principles, ie: 1) gives the impression that the student worksheet prepared viable and important to learn, 2) direct the focus of student worksheets on things that are assumed in accordance with the reader needs, 3) the advantage contents presented in LKS, and 4) expectations relating to the prospects of the authors of the study and perfection of Students Worksheets.

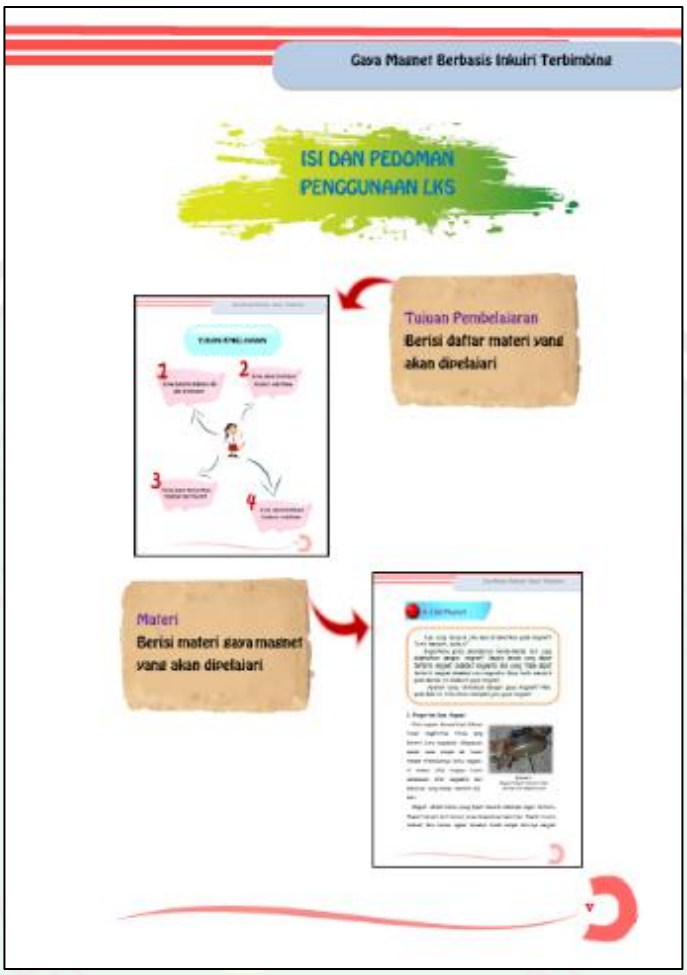
5) Table of Contents



Picture 4.5 Table of Contents

The table of contents provides the learning section that will be discussed and the activities to be carried out experiments. On the contents page and included a list of pages from all parts of the learning contained in the Student Worksheet, so that readers easily find the subject sought.

6) The Content and Guidelines for Use of Student Worksheet



Picture 4.6 The Content and Guidelines for Use of Student Worksheet

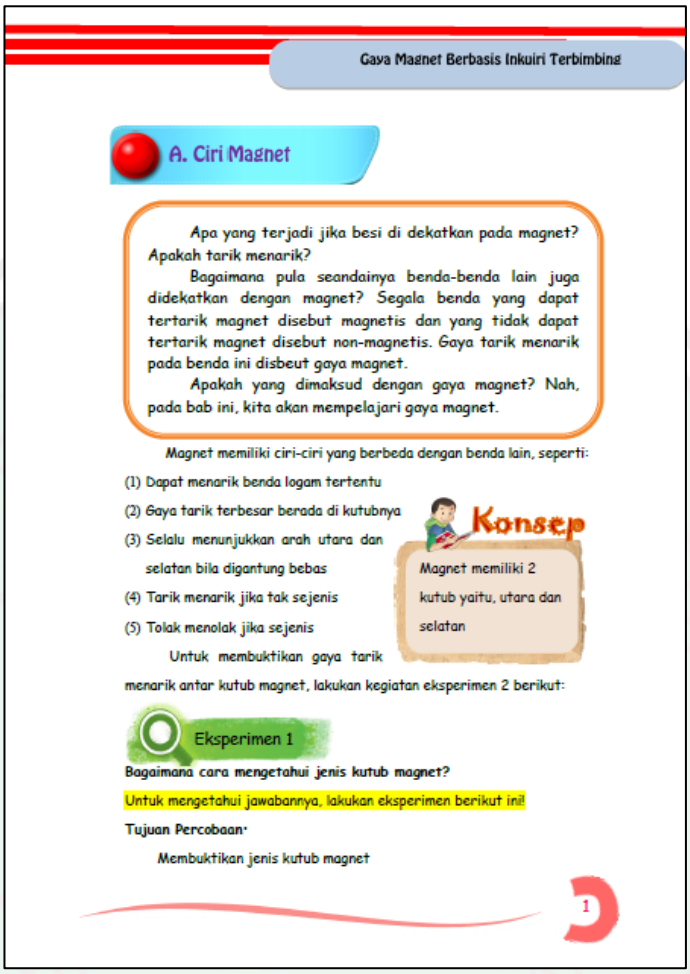
Guidelines for the use of student worksheets include an explanation of each of the parts contained in the student worksheet and also measures the use of Student Worksheet, so that students can easily understand the context of the explanations contained therein.

7) Learning Objectives

Picture 4.7 Learning Objectives

Learning objectives are intended to make students able to clearly know the material to be learned in this Student Worksheet easily.

8) The Material



Gaya Magnet Berbasis Inkuiri Terbimbing

A. Ciri Magnet

Apa yang terjadi jika besi di dekatkan pada magnet? Apakah tarik menarik?

Bagaimana pula seandainya benda-benda lain juga didekatkan dengan magnet? Segala benda yang dapat tertarik magnet disebut magnetis dan yang tidak dapat tertarik magnet disebut non-magnetis. Gaya tarik menarik pada benda ini disbeut gaya magnet.

Apakah yang dimaksud dengan gaya magnet? Nah, pada bab ini, kita akan mempelajari gaya magnet.

Magnet memiliki ciri-ciri yang berbeda dengan benda lain, seperti:

(1) Dapat menarik benda logam tertentu
(2) Gaya tarik terbesar berada di kutubnya
(3) Selalu menunjukkan arah utara dan selatan bila digantung bebas
(4) Tarik menarik jika tak sejenis
(5) Tolak menolak jika sejenis

Konsep

Magnet memiliki 2 kutub yaitu, utara dan selatan

Untuk membuktikan gaya tarik menarik antar kutub magnet, lakukan kegiatan eksperimen 2 berikut:

Eksperimen 1

Bagaimana cara mengetahui jenis kutub magnet?

Untuk mengetahui jawabannya, lakukan eksperimen berikut ini!

Tujuan Percobaan:

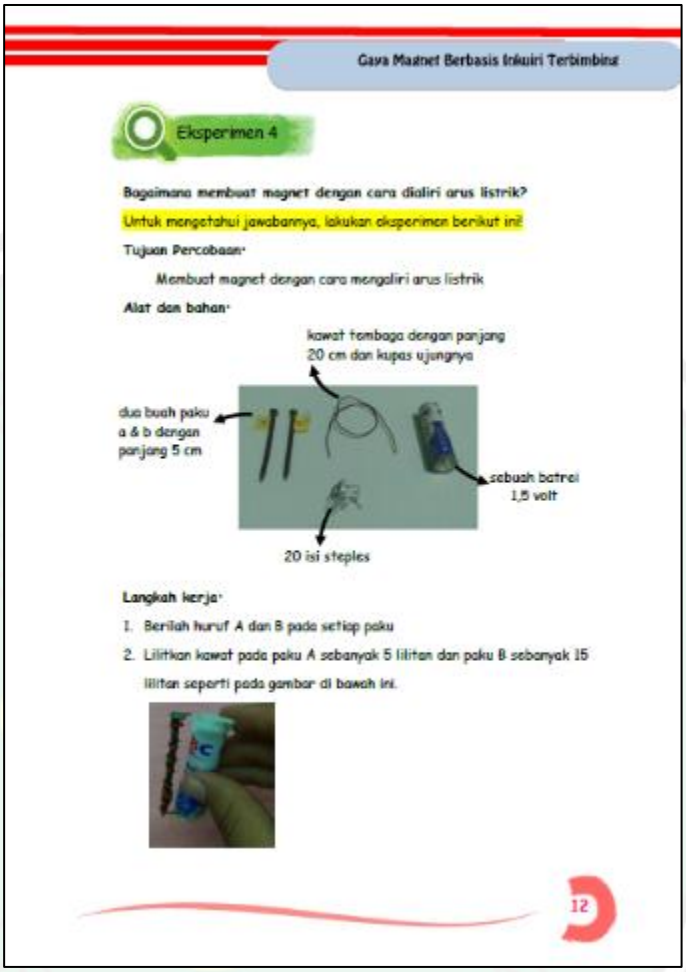
Membuktikan jenis kutub magnet

1

Picture 4.8 The Material

Material presented with pictures that support these materials so that students more easily understand the material presented.

9) The Experiment



Picture 4.9 The Experiment

Experimental activities given after the students understand the material. The activities carried out experiments take advantage objects that exist around the student and their expected to better understand the experimental activity not only through only concepts. After conducting the experiment students were asked to perform tasks that provides about the matter further related to materials that have been studied experimentally.

10) The Concept

Picture 4.10 The Concept

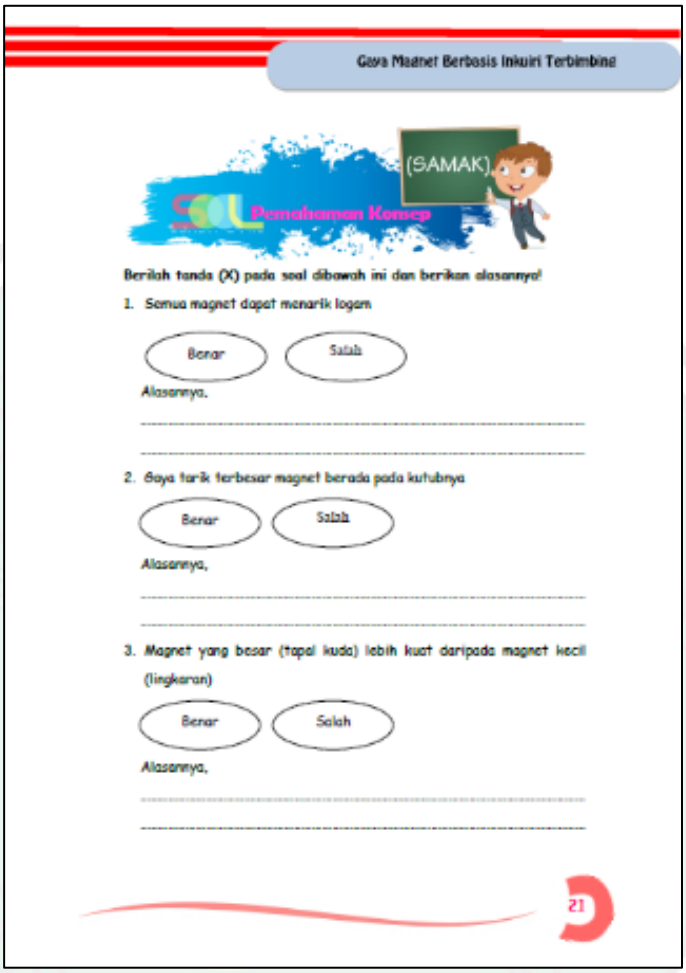
The column concept is the concept of the material covered, so that students better understand the the core of the material being studied. Before the students carry out experiments and writing conclusions, those conclusions are matched with the concept that there is truth in the concept column. Having matched the student will know the right or wrong conclusion that they understand it, but it also knows the correct concept

11) *Tahukah kamu?*

Picture 4.11 *Tahukah kamu?*

The column of *Tahukah kamu?* Is the contains the history of a magnet and it lies dubbed as the city of Magnesia.

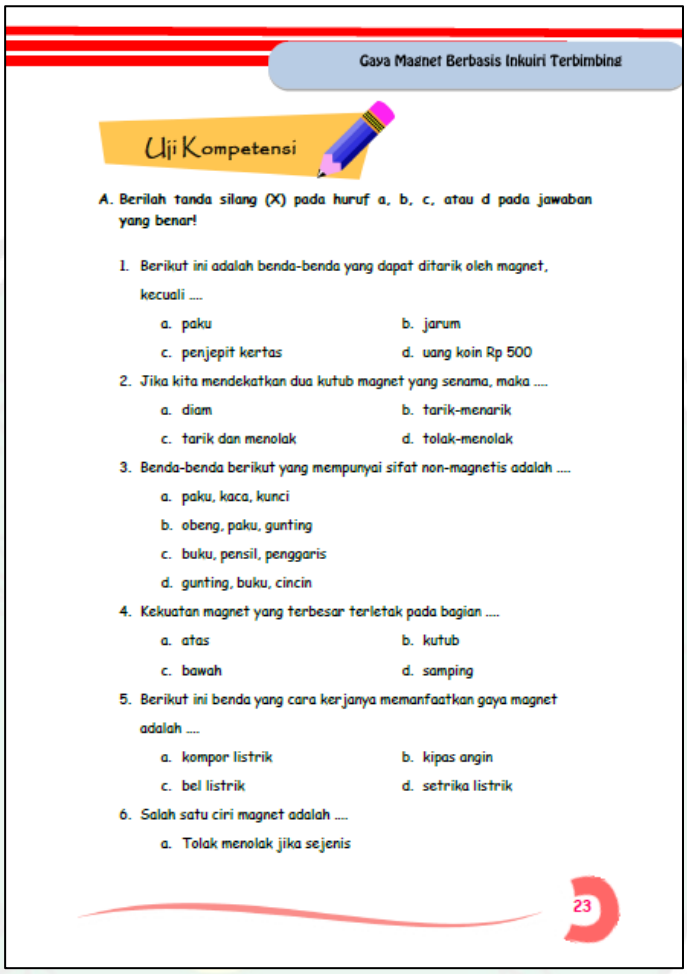
12) *Soal Pemahaman Konsep*



Picture 4.12 *Soal Pemahaman Konsep*

Problem understanding of concepts students are expected to answer the correct concept and did not experience any misconceptions again.

13) *Uji Kompetensi*



Gaya Magnet Berbasis Inkuiri Terbimbing

Uji Kompetensi

A. Berilah tanda silang (X) pada huruf a, b, c, atau d pada jawaban yang benar!

1. Berikut ini adalah benda-benda yang dapat ditarik oleh magnet, kecuali ....
   a. paku
   b. jarum
   c. penjepit kertas
   d. uang koin Rp 500
2. Jika kita mendekatkan dua kutub magnet yang senama, maka ....
   a. diam
   b. tarik-menarik
   c. tarik dan menolak
   d. tolak-menolak
3. Benda-benda berikut yang mempunyai sifat non-magnetis adalah ....
   a. paku, kaca, kunci
   b. obeng, paku, gunting
   c. buku, pensil, penggaris
   d. gunting, buku, cincin
4. Kekuatan magnet yang terbesar terletak pada bagian ....
   a. atas
   b. kutub
   c. bawah
   d. samping
5. Berikut ini benda yang cara kerjanya memanfaatkan gaya magnet adalah ....
   a. kompor listrik
   b. kipas angin
   c. bel listrik
   d. setrika listrik
6. Salah satu ciri magnet adalah ....
   a. Tolak menolak jika sejenis

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Picture 4.13 *Uji Kompetensi*

Competency test or *uji kompetensi* contains multiple choice questions and essays are intended to measure students understanding of the material that has been studied.

14) The Bibliography

Picture 4.14 The Bibliography

The Bibliography or *Daftar Pustaka*contains references to reading material relevant to the material in the student worksheet

2. The Product Validation

The data obtained in this study, there are two kinds, ie quantitative and qualitative data. The data was obtained through two stages of assessment, namely the expert validation and field testing. The validation conducted by the validator consisting of three experts 1) content validator, 2) design validator, 3) language

validator, and 4) teacherclass at SDN Dinoyo 2 Malang act as implementers of thematic learning.

The data obtained are qualitative and quantitative data. Qualitative data in the form of additional assessment or advice from the validator, while quantitative data derived from the questionnaire Likert scale ratings. Data presentation and data analysis by an material experts, design experts, linguists experts and teachingclass SDN Dinoyo 2 Malang along with criticism and suggestions.

a. The Result Validation of Material Experts

Draft development of Student Worksheets that have been developed by the authors is in the form of Student Worksheet Magnetism Matter Based Guided Inquiry to improve the understanding of the concept of fifth grade students of SDN Dinoyo 2 Malang

1) The Presentation of Quantitative Data

Student Worksheets development products are tested to Mr. Agus Mukti Wibowo is material expert magnetic force. Exposure of content expert assessment results submitted by an instrument in the form of questionnaires. Quantitative data can be seen in the following table:

Table 4.1The Result Assessment of Material Expert

No.	Statement	X	x_i
1.	The suitability of formulation of topics on the development of Student Worksheet	4	4
2.	The suitability of the material presented in the development of Student Worksheet	4	4
3.	The suitability Core Competences with Indicator	4	4
4.	The suitability of indikator presented with Basic Competences	4	4
5.	The suitability of systematic descripstion content of learning	3	4
6.	The clatity of materials explanation	4	4
7.	The accuracy of the material presented to provide an understanding concept of the students	4	4
8.	The suitability of experimental activities with discussion	4	4
9.	The accuracy of the evaluation instrument used to measure the ability of students	3	4
10.	The accuracy of the addition *SAMAK (Soal Pemahaman Konsep)* on the Student Worksheets	4	4
11.	The suitability between pretest and posttest instrument to the material covered	4	4
12.	The ease of language used in the Student Worksheet	3	4
Totals		45	48

$$P=\frac{\sum x}{\sum xi}x100\%$$

$$P=\frac{45}{48}x100\%$$

P = 93,75%

Based on the calculations above, the observations made by material experts overall content reached 93.75%. If matched with a table of the eligibility criteria, then the score is included in the criteria of very valid or very feasible, but according to experts the material expert researchers must still revise some parts of the Student Worksheet the magnetic force Based Guided inquiry that Student Worksheets more perfect.

2) The Presentation of Qualitative Data

The qualitative data were derived from comments and suggestions content expert about the contents Student Worksheets magnetic force based guided inquiry through open questions will be poured. Here is a suggestion of ancontents expert assessment *"Secara umum materi sudah sesuai dengan KI dan KD yang ada, konsep yang dituangkan dalam lembar kerja siswa (LKS) juga sangat bagus, akan tetapi ada beberapa perbaikan pada bagian seperti konsep yang magnet yang diberikan kepada siswa, peletakan sub bab materi dan kegiatan eksperimen."*

All data from the review, assessment and discussions with experts used as a basis for revising the contents for improving component Student Worksheets before been tested on students as users of the product development.

3) Revision of Product Development

Based on the results of the assessment or expert feedback the content, then basically Student Worksheets Based Guided Inquiry magnetic force needs to get revisions or improvements. And feedback, suggestions and comments from experts trying to fill is realized as well as possible in order to improve the development of the resulting product. Based on the analysis, the revision of the Student Worksheets are as follows:

Table 4.2 The Revision of Content Expert

No	Revised Points	Before Revision	After Revision
1.	Changing misconception in the magnetic force	All magnet made from iron	Not all magnet made from metals
2.		Earth's magnetic poles and magnet poles lies on one place	Earth's magnetic poles and magnet poles lies on one way
3.	Adding a magnetic definition of languages	Magnet is a material that can attract some of the specific metal	Magnet from Greece word *maghnithis lithos* mean magnesian stone
4.	Eliminate the element of steel in the metal charge for steel is metal alloy	Magnets only can attract certain metals. Metallic iron, nickel, cobalt steel and can be pulled by a magnet	Magnets can only attract certain metals. Metallic iron, nickel and cobalt can be attracted by a magnet
5.	Adding mking of magnet temporarily	An artificial magnets made by humans	Magnetic properties in three ways to create a magnetic body is only temporary

b. The Result Validation of Design Experts

Draft development of student worksheets that have been developed by the authors is in the form of Student Worksheet Magnetism Matter based Guided Inquiryto improve the understanding of the concept of fifth grade students of SDN Dinoyo 2 Malang

1) The Presentation of Quantitative Data

Student Worksheets development products are tested to Mr. Ahmad Abtokhi is design expert. Exposure of design expert assessment results submitted by an instrument in the form of questionnaires to LKS questionnaire. Quantitative data can be seen in the following table:

Table 4.3 The Result Assessment of Design Expert

No.	Statement	X	x_i
1.	Cover design in accordance with the content of the material	4	4
2.	The typeface used in accordance with the student SD/ MI fifth grade	4	4
3.	The size of the letters used in accordance with the student SD / MI fifth grade	4	4
4.	Image in accordance with the material LKS	4	4
5.	The images used to attract students	4	4
6.	The layout of the images on LKS interesting	3	4
7.	The images on the experimental measures in accordance with the working instructions	4	4
8.	Image size on the appropriate image	4	4
9.	The color consistent on a *LKS*	4	4
10.	Interesting layout on *LKS*	3	4
Total		38	40

$$P=\frac{\sum x}{\sum xi}x100\%$$

$$P=\frac{38}{40}x100\%$$

P = 95%

Based on the calculations above, the observations made by design experts overall content reached 95%. If matched with a table of the eligibility criteria, then the score is included in the criteria of very valid or very feasible, but according to design expert researchers must still revise some parts of theStudent Worksheeton Magnetism Matter Based Guided Inquiry that Student Worksheet more perfect.

2) The Presentation of Qualitative Data

The qualitative data were derived from comments and suggestions design expert about the contents LKS magnetic force based guided inquiry through open questions will be poured. Here is a suggestion of ancontents expert

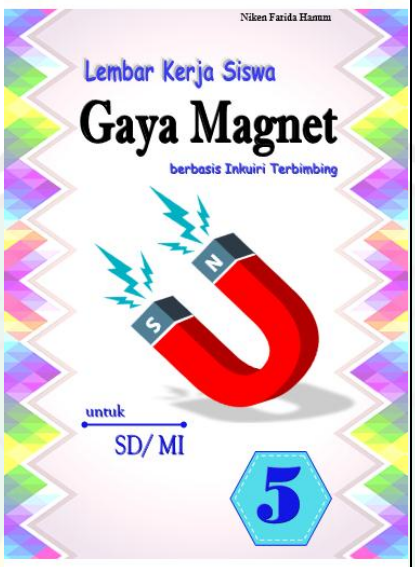
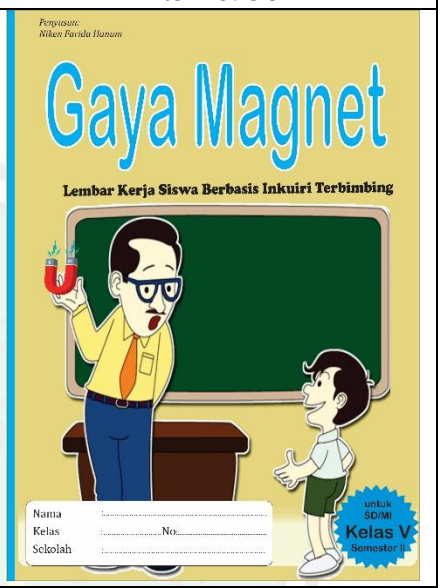
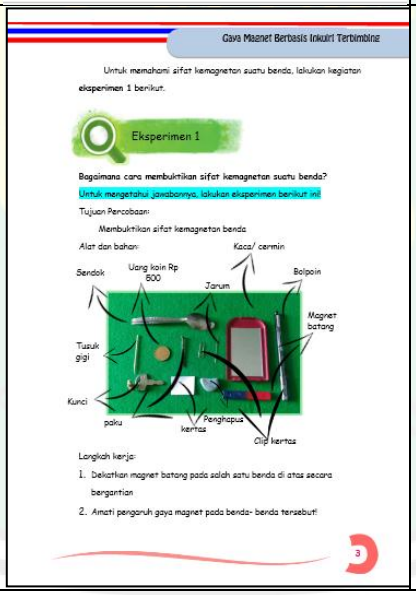
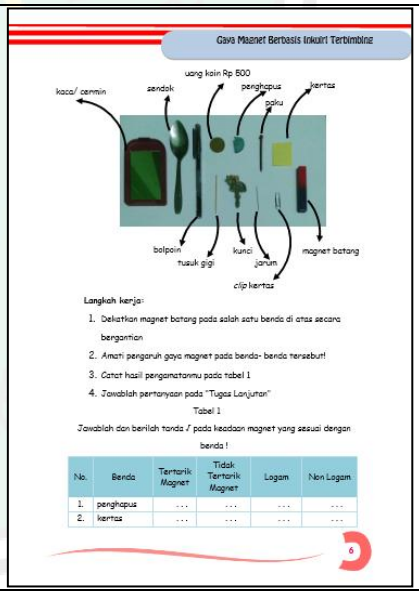
assessment *"Desain yang digunakan terutama pada sampul harus diperbaiki, tata letak materi, penggunaan gambar untuk materi dan eksperimen juga penting untuk diperbaiki. Header pada LKS lebih baik digunakan warna yang sama pada tiga garis dan karena LKS ini akan digunakan untuk anak SD maka pemilihan warna dan gambar juga harus menarik"*

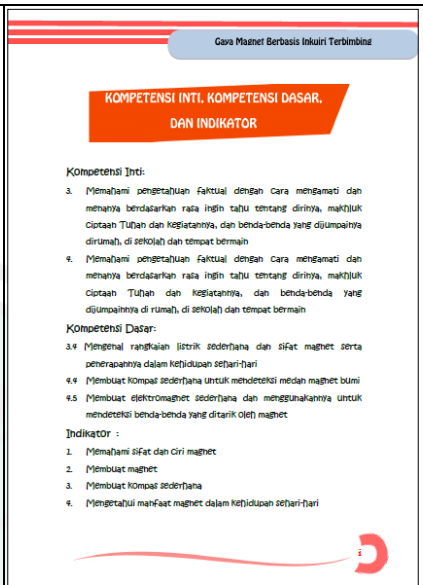
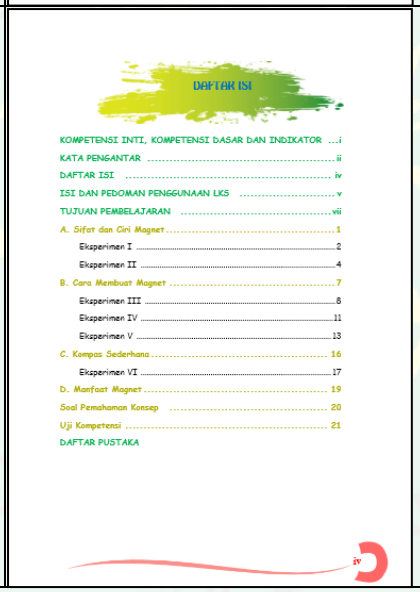
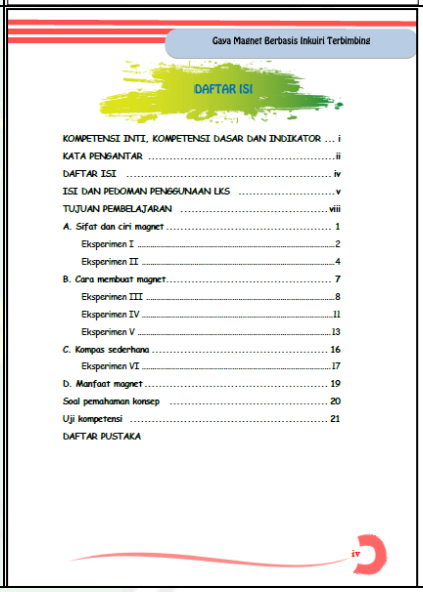
All data from the review, assessment and discussions with experts used as a basis for revising the contents for improving component Student Worksheet before been tested on students as users of the product development.

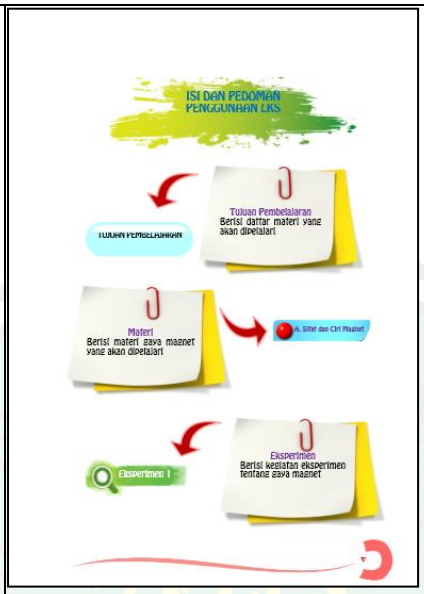
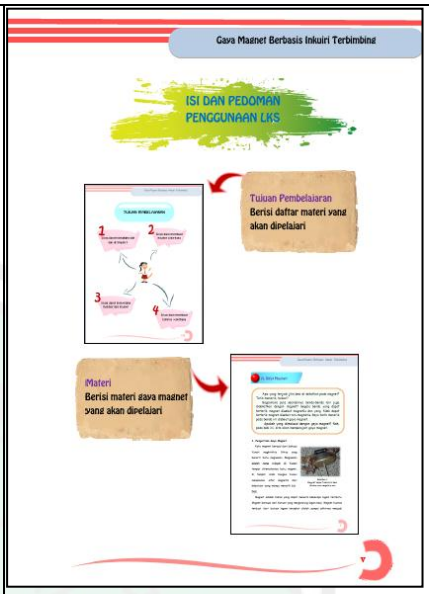
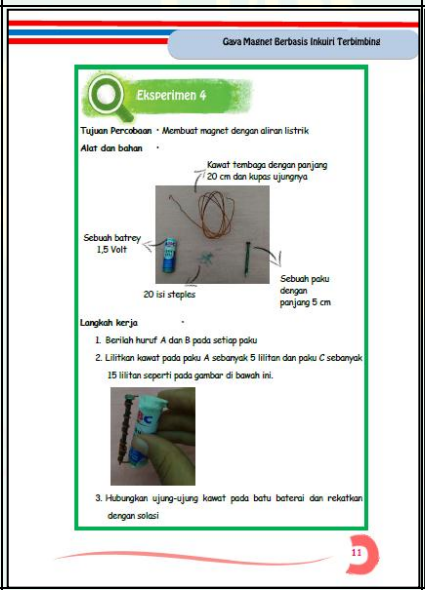
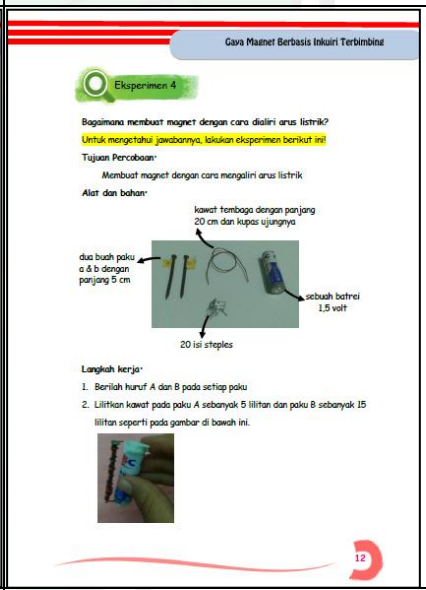
3) Revision of Product Development

Based on the results of the assessment or instructional design expert feedback, basically Student Worksheetneeds to get revisions or improvements. And feedback, suggestions and comments from design experts attempted realized as well as possible in order to improve the development of the resulting product.Based on the analysis, the revision of the Student Worksheet is as follows:

Table 4.4 The Revision of Design Expert

No.	Revised Points	Before Revision	After Revision
1.	Front Cover Design		
2.	The Colours and layout of *LKS*		

3.	Core Competence and Basic Competence		
4.	Table of contents		

5.	The Content and Guidelines for Use of Worksheet		
6.	Experiments		
7.	Picture Information		

8.	The Increase of Image	 

c. The Result Validation of Linguist Experts

Draft development of student worksheets that have been developed by the authors is in the form of Student Worksheet on Magnetism Matter Based Guided Inquiry to improve the understanding of the concept of fifth grade students of SDN Dinoyo 2 Malang

1) The Presentation of Quantitative Data

Student Worksheet development products are tested to Mr. Muh. Zuhdi Hamzahis language expert. Exposure of language expert assessment results submitted by an instrument in the form of questionnaires to Student Worksheet questionnaire. Quantitative data can be seen in the following table:

Table 4.5 The Result Assasment of Linguist Experts

No.	Statement	X	x_i
1.	The suitability of language or sentence on the cover of Student Worksheet	4	4
2.	The suitability of language or sentence in the preface to Student Worksheet (LKS)	4	4
3.	The suitability of language or sentence in the study objectives to Student Worksheet	4	4
4.	The ease of language to be understood in the material Student Worksheet	4	4
5.	The ease of language to be understood in the experiments of Student Worksheet	4	4
6.	The suitability of the language used at *"Tugas Lanjutan"*	3	4
7.	The suitability of the language used at *"Tahukah Kamu"*	4	4
8.	The suitability of the language used at "Seputar Pertanyaan"	4	4
9.	The suitability of the language used at *"SAMAK (Soal Pemahaman Konsep)"*	4	4
10.	The suitability of the language used at evaluation	4	4
Total		39	40

$$P=\frac{\sum x}{\sum xi}x100\%$$

$$P=\frac{39}{40}x100\%$$

P = 97,5%

Based on the calculations above, the observations made by teaching experts overall content reached 97,5%. If matched with a table of the eligibility criteria, then the score is included in the criteria of very valid or very feasible, but according to design expert researchers must still revise some parts of the Student Worksheet on Magnetism Matter Based Guided Inquirythat Student Worksheet more perfect.

2) The Presentation of Qualitative Data

The qualitative data were derived from comments and suggestions teaching expert is fifth grade teacher at SDN Dinoyo 2 Malang about the contents Student Worksheet on Magnetism Matter Based Guided Inquirythrough open questions will be poured. Here is a suggestion of an teaching expert assessment*"Penyajian sampulnya masih membutuhkan kombinasi gambar dan kata yang lebih variatif dan menarik. Selanjutnya, sebaiknya dalam mengasah kemampuan berpikir siswa melalui LKS dibutuhkan pengelompokan pertanyaan-pertanyaan yang lebih merangsang struktur berpikir siswa"*

All data from the review, assessment and discussions with experts used as a basis for revising the contents for improving component Student Worksheet before been tested on students as users of the product development.

d. The Result Validation of Teaching Experts

Draft development of student worksheets that have been developed by the authors is in the form of Student Worksheet onMagnetism Matter Based Guided Inquiry to improve the understanding of the concept of fifth grade students of SDN Dinoyo 2 Malang

1) The Presentation of Quantitative Data

Student Worksheet development products are tested to Mrs. Nunik Martin Lestariis teaching expert in fifth grade. Exposure of teaching expert assessment results submitted by an instrument in the form of questionnaires toStudent Worksheetquestionnaire. Quantitative data can be seen in the following table:

Table 4.6 The Result Assassment of Teacher

No.	Statement	X	x_i
1.	Cover design Student Worksheet in accordance with the contents of the material	4	4
2.	The suitability of the material presented in the development of Student Worksheet	3	4
3.	The suitability indicators presented with basic competence	3	4
4.	The suitability systematic description of the learning content	4	4
5.	The clarity exposure of the material	3	4
6.	The clarity of the work steps in experimental activities	3	4
7.	The accuracy of the material presented to provide understanding of the concept to students	4	4
8.	The accuracy of the addition *SAMAK (Soal Pemahaman Konsep)* in the Student Worksheet	3	4
9.	The accuracy of the evaluation instrument used to measure the ability of students	4	4
10.	The ease language used in the Student Worksheet	4	4
Total		35	40

$$P=\frac{\sum x}{\sum xi}x100\%$$

$$P=\frac{35}{40}x100\%$$

P = 87,5%

Based on the calculations above, the observations made by teaching experts overall content reached 87,5%. If matched with a table of the eligibility criteria, then the score is included in the criteria of very valid or very feasible, but according to design expert researchers must still revise some parts of the Student Worksheet on Magnetism Matter Based Guided Inquirythat Student Worksheetmore perfect.

2) The Presentation of Qualitative Data

The qualitative data were derived from comments and suggestions teaching expert is fifth grade teacher at SDN Dinoyo 2 Malang about the contents Student Worksheet on Magnetism Matter Based Guided Inquiry through open questions will be poured. Here is a suggestion of anteaching expert assessment *"Lembar Kerja Siswa (LKS) yang dibuat Alhamdulillah sudah bagus dan sangat membantu proses pembelajaran, dan akan lebih baik jika kegiatan siswa disesuaikan dengan jam tatap muka pembelajaran mengingat pembelajaran tematik"*

All data from the review, assessment and discussions with experts used as a basis for revising the contents for improving component Student Worksheet before been tested on students as users of the product development.

3. Field Trials

Data validation is taken from the test results against Student Worksheet on February 8, 2017. The products were tested in the field development in the form of Student Worksheet. According to Benny, there are three stages in the development of such product testing:[65] 1) one-on-one trial, 2) small group evaluation trial, and 3) trials field evaluation yang carried out by all students. However, because of very short time given to researchers eventually researchers used two stages, namely, 1) the small group trial or small group evaluation was represented by 10 students drawn randomly graders VA and VB which is a control class and experimental class and 2) field trials or field evaluation is done

[65] Benny A. Pribadi, *Model Desain Sistem Pembelajaran*. (Jakarta: Dian Rakyat, 2009),p.107-108

by all students VA SDN Dinoyo 2 Malang. Following exposure of the test result data.

a. Small Group Evaluation

1) The Presentation of Quantitative Data

Below quantitative data exposure to the small group evaluation results in table 4.7:

Table 4.7 The Result of Small Group Evaluation

No.	Statements	Percentage (%)	Description
1.	The Student Worksheet easy you study	96	Very Suitable
2.	The Student Worksheetgive you spirit when you study	96	Very Suitable
3.	The easily understand material in Student Worksheet	88	Very Suitable
4.	The questions of Student Worksheetnot difficult to working	75	Suitable
5.	The type of font and size in Student Worksheetinteresting	96	Very Suitable
6.	There is no difficult word in Student Worksheet	71	Suitable
7.	The instruction in experiments suitable	92	Very Suitable
8.	The easily of language that used	96	Very Suitable
9.	The experiments activity help you to collaborate with friends	92	Very Suitable
10.	The colour and picture in Student Worksheetinterest	96	Very Suitable
Totals		89.6%	Very Suitable

2) Data Analysis

Quantative data obtained from the small group evaluation in table 4.7, the next step will analyze all the data. Below is the percentage Studen Worksheet individual testing:

$$P = \frac{\sum X}{\sum Xi} x\ 100\%$$

$$P = \frac{215}{240} x\ 100\%$$

P = 89.6%

Information:

x: score respondents answer the fifth grade students at SDN Dinoyo 2 Malang

x_i: score the highest response

P: percentage level

The percentage of individual test result was 89.6%. Once converted to 4 scale conversion table, the level of achievement of 89.6% in the qualification is valid so that these materials do not need to be revised. Criticism and suggestions from respondents on the small group trial in question through a questionnaire, received and taken into consideration to enhance Students Worksheet *(LKS).*

b. Field Evaluation

3) The Presentation of Quantitative Data

Below quantitative data exposure to the small group evaluation results in table 4.8:

Table 4.8 The Result of Field Evaluation

No.	Statements	Percentage (%)	Description
1.	The Student Worksheet easy you study	93	Very Suitable
2.	The Student Worksheet give you spirit when you study	93	Very Suitable
3.	The easily understand material in Student Worksheet	87	Very Suitable
4.	The questions of Student Worksheet not difficult to working	83	Suitable
5.	The type of font and size in Student Worksheet interesting	90	Very Suitable
6.	There is no difficult word in Student Worksheet	82	Very Suitable
7.	The instruction in experiments suitable	88	Very Suitable
8.	The easily of language that used	93	Very Suitable
9.	The experiments activity help you to collaborate with friends	94	Very Suitable
10.	The colour and picture in Student Worksheet interest	88	Very Suitable
Totals		89%	Very Suitable

4) Data Analysis

Quantative data obtained from the small group evaluation in table 4.7, the next step will analyze all the data. Below is the percentage Student Worksheet individual testing:

$$P = \frac{\sum X}{\sum Xi} x\ 100\%$$

$$P = \frac{1068}{1200} x\ 100\%$$

P = 89%

Information:

x: score respondents answer the fifth grade students at SDN Dinoyo 2 Malang

x_i: score the highest response

P: percentage level

The percentage of individual test result was 89%. Once converted to 4 scale conversion table, the level of achievement of 89% in the qualification is valid so that these materials do not need to be revised. Criticism and suggestions from respondents on the small group trial in question through a questionnaire, received and taken into consideration to enhance Students Worksheet *(LKS).*

4. Learning Outcomes

From the implementation of a pre-test and post-test grade students of SDN Dinoyo 2 Malang on field evaluation will be presented in the following table:

Tabel 4.9
The Result Pre-test and Post-test in Experiment Class

No.	NAME	Score	
		Pre-test (x)	*Post-test* (X_1)
1	Aamira Faheena Ghania	49	95
2	Achmad Royfi El Hakam	41	69
3	Anggito Galih Abimanyu	30	72
4	Aurellia Athallah	45	70
5	Clarissa Arintya Azzahra	53	72
6	Clarista Aurelia Azzahra	45	83
7	Cornelia Chyntia Lidya P	49	83
8	Dhimas Sukma Majida	43	90
9	Elgha Radhitya Arifadani	27	74
10	Fatah Rozaan Yudhayana	42	78
11	Febriana Eka Saraswati	61	80
12	Firfil Zifana Ngapibra	31	78
13	Ivena Fariza Ramadhany	62	80
14	Kalinda Armitafari	42	81
15	Keishya Aliffia Mashudi	53	74
16	Mutiara Karina Hawarich	56	90
17	Nabila Alifia Rahma	45	83
18	Neisyah Alidya Zahrazi	48	71
19	Olivia Chelsea Mawar	42	76
20	Pradiva Titha Aurellya	69	98
21	Rakay Pikatan Pamungkassiwi	37	82
22	Ramadhan Octavian Alvin N	47	60
23	Reika Amalia Syahputri	39	74
24	Rendrian Rizaldhi Putra A	40	90
25	Rinoe Hilmi Naufal	45	68
26	Rizqullah Akbar Ramadhan	42	82
27	Sabilla Zahwa Kanahaya	60	88
28	Saffanah Azka Zahrani	45	92
29	Vonnylia Julian Putri Utama	31	75
30	Fyela Wahyu Fyryna Almira	53	80
Totals		1372	2388
Average		46	80

From the results of pre-test conducted in the experimental class or class VA students named Elgha Radhitya Arifadani get the lowest value for pre-test that is 27. While Pradiva Titha Aurellya get the highest score for pre-test that is, 69. According to the observation in the field while doing a matter of pre-test student named Elgha Radhitya Arifadani looks not serious while doing and after in question he is a little trouble while working on the pre-test. Different with Pradiva Titha Aurellya who get the highest score during pre-test after viewing and looking for information, this student is known as an active and intelligent student and often follow the selection of Olympic Elementary race.

From the post-test results conducted in the experimental class or VA class students named Ramadan Octavian Alvin N get the lowest score for the post-test is 60. While Pradiva Titha Aurellya get the highest value for post-test that is, 95. According to the observation on the field when Working on a post-test student named Ramadan Octavian Alvin N has done a good job, but when the experimental activity in this class of students several times did not follow it well and disturb other students. Different with Pradiva Titha Aurellya who get the highest score during pre-test and post-test.

Tabel 4.10
The Result Pre-test andPost-test in Control Class

No.	NAME	Score	
		Pre-test (y)	*Post-test* (y_1)
1	Abwabul Choir	53	53
2	Achmad Firdhan	32	60
3	Ahmad Fauzan Z	35	62
4	Aisyah Puji W	29	58
5	Aldira Syawal I	27	43
6	Amalia Nur S	64	84
7	Ammara F	45	52
8	Anindya S A	45	59
9	Annisa Nur H	42	63
10	Berliana D	37	57
11	Cello Afla Fauza	36	62
12	Clarissa Aurelia	40	52
13	Dhyfa Harpha V	40	60
14	Dicky Habib P	45	56
15	Hasbullah R	30	58
16	Helmy Aminudin	41	55
17	Kyra Orleana W	48	59
18	Muhammad D	43	65
19	Mazzaluna R P Z	44	59
20	Mia Dwi Calista	25	51
21	M. Khoirussyifa'	30	49
22	Muhammad Rizki	52	62
23	Najwa Syarifah T	32	66
24	Naysilla Dwi Y	37	63
25	Novagvinea F	44	60
26	Nyssa Achadia S	40	61
27	Raya Rizky R	38	61
28	Revania Audi Z	46	54
29	Sofiah Fadhila Z	42	48
30	Zidan Sabana M	35	58
Totals		1197	1750
Average		40	58

From the results of pre-test conducted in the control class or class VB students named Mia Dwi Calista get the lowest value for pre-test that is 25. While Amalia Nur S get the highest score for pre-test that is, 64. According to the observation in the field while doing a matter of pre-test student named Mia Dwi Calista looks little trouble while working on the pre-test. Unlike Amalia Nur S who get the highest score during pre-test after viewing and looking for information, this student is known as an active and intelligent student and often follow the selection of Olympic Elementary race.

From the post-test results conducted in the control class or VB class students named Aldira Syawal get the lowest score for the post-test is 43. While Amalia Nur S get the highest value for post-test that is, 84. According to the observation on the field when working on a post-test student named Aldira Syawal has done a good job, but when the experimental activity in this class of students several times did not follow it well and disturb other students. In contrast to Amalia Nur S who get the highest score during pre-test and post-test.

Based on data from Table 4.10 shows that the average value of the pre-test experimental class was 46% and the average value of the post-test experimental class is 80%. This indicates that the value of the post-test better than the pre-test. The difference in the average value of the pre-test experimental class and the average value of the post-test experimental class is 34%. From the data obtained showed that there was a significant influence on the use of Student Worksheet which has been developed to increase student learning outcomes SDN Dinoyo 2 Malang.

Tabel 4.11 Pre-test Score on Experimental Class and Control Class

No.	Class	Students Total	Minimal Score	Maximal Score	Average
1.	Experiment	30	27	69	46
2.	Control	30	25	64	40

In the experimental class the lowest score was 27 and the highest is 69. The average value of the experimental class is 46. Not much different from the control class the lowest value is 25 and the highest is 64. The average value of the control class is 40.

Data post-test value is given treatment after the student's ability. The treatment in question is class students experiment taught using Student Worksheet the development of researchers in the form of Student Worksheet on Magnetism Matter Based Guide Inquiry, while the control class taught using books that are already available in schools, then these two classes were given post -test to determine the extent to which the student's ability to understand the material by using different materials.

Tabel 4.12 Score Post-test Experiment Class and Control Class

No.	Class	Students Total	Minimal Score	Maximal Score	Average
1.	Experiment	30	60	95	80
2.	Control	30	43	84	58

In the experimental group the lowest score was 60 and the highest is 95. The average value of the experimental class is 80. While in the control class was 43 and the lowest value highest value is 84. The average value of the control class

is 58. The next step to know whether or not changes in student learning outcomes between before and after treatment exerts on each sample class test score gains.

Tabel 4.13 Learning Outcomes Data (Gain Score)

No.	Class	Students Total	Minimal Score	Maximal Score	Average
1.	Experiment	30	46	80	34
2.	Control	30	40	58	18

Based on data from the value of the experimental class is a class that is taught by using Student Worksheet the development of researchers in the form of Student Worksheet on Magnetism Matter Based Guided Inquiry showed results better than the control class is the class that is taught by using worksheets that already available at the school. Can be seen in Table 4.15 where the value of the experimental class increased 34% from 46 to 80, whereas the control group had increased 18% from 40 to 58.

The value data class post-test and post-test experimental control group were then analyzed by two-sample t test (independent t-test) with a significance level of 0.05. This analysis technique is used to determine whether there is a treatment effect imposed on groups of objects.

Based on Table 4.15 searched whether Student Worksheet developed to improve student learning outcomes or not. The steps of the t test as follows:

Step 1. Make Ho and Ha in sentences

H_0 : There is no difference between student learning outcomes using Student Worksheet on Magnetism Matter Based Guided Inquiry with

students who do not use Student Worksheet on Magnetism Matter Based Guided Inquiry

H_a :There is a difference between student learning outcomes using magnetic force Student Worksheet on Magnetism Matter Based Guided Inquiry with students who do not use Student Worksheet on Magnetism Matter Based Guided Inquiry

Step 2. Calculate dsg *(deviasi standar gabungan)*

Tabel 4.14 Varians Calculate

No. Respondent	Post-test Score		X_1-$\bar{X}$	$(X_1 - \bar{X})^2$	X_2-$\bar{X}$	$(X_2 - \bar{X})^2$
	Experiment Class (X_1)	Control Class (X_2)				
1	95	53	15	225	-5	25
2	69	60	-11	121	2	4
3	72	62	-8	64	4	16
4	70	58	-10	100	0	0
5	72	43	-8	64	-15	225
6	83	84	3	9	26	676
7	83	52	3	9	-6	26
8	90	59	10	100	1	1
9	74	63	-6	36	5	25
10	78	57	-2	4	-1	1
11	80	62	0	0	4	16
12	78	52	-2	4	-6	36
13	80	60	0	0	2	4
14	81	56	1	1	-2	4
15	74	58	-6	36	0	0
16	90	55	10	100	-3	9
17	83	59	3	9	1	1
18	71	65	-9	81	7	49
19	76	59	-4	16	1	1
20	98	51	18	324	-7	49
21	82	49	2	4	-9	81
22	60	62	-20	400	4	16
23	74	66	-6	36	8	64
24	90	63	10	100	5	25
25	68	60	-12	144	2	4

No. Respondent	Post-test Score		X_1-$\bar{X}$	$(X_1 - \bar{X})^2$	X_2-$\bar{X}$	$(X_2 - \bar{X})^2$
	Experiment Class (X_1)	Control Class (X_2)				
26	82	61	2	4	3	9
27	88	61	8	64	3	9
28	92	54	12	144	-4	16
29	75	48	-5	25	-10	100
30	80	58	0	0	0	0
Totals	2388	1750		2224		1492
Average	80	58				

Looking for a variance with the following formula:

$$V_1 = \frac{\sum(X_1 - \bar{X})^2}{n_1 - 1}$$

$$V_1 = \frac{2224}{30 - 1}$$

$$V_1 = 77$$

$$V_2 = \frac{\sum(X_2 - \bar{X})^2}{n_2 - 1}$$

$$V_2 = \frac{1492}{30 - 1}$$

$$V_2 = 51$$

Formula to find the standard deviation of the combined as follows:

$$dsg = \sqrt{\frac{(n_1 - 1)V_1 + (n_2 - 1)V_2}{n_1 + n_2 - 2}}$$

Informations:

n_1= a lot of data of group 1

n_2= a lot of data of group 2

V_1= varians data group 1

V_2= varians data group 2

$$dsg = \sqrt{\frac{(n_1 - 1)V_1 + (n_2 - 1)V_2}{n_1 + n_2 - 2}}$$

$$dsg = \sqrt{\frac{(30 - 1)77 + (30 - 1)51}{30 + 30 - 2}}$$

$$dsg = \sqrt{\frac{2233 + 1479}{58}}$$

$$dsg = \sqrt{\frac{3712}{58}}$$

$$dsg = 8$$

Step 3. Determining t-test criteria:

a. $H_a$accepted if$t_{hitung} > t_{tabel}$, then significant meant $H_a$acceptedand H_0refused

b. H_0accepted if$t_{hitung} < t_{tabel}$, then significant meant $H_a$refusedand H_0 accepted

Step 4. Counting the post-test results of the experimental class and post-test control class:

Analysis of the results of post-test experimental classes and post-test control group with the formula t-test as follows:

$$t = \frac{\bar{X}_I - \bar{X}_2}{dsg\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$t = \frac{80 - 58}{8\sqrt{\frac{1}{30} + \frac{1}{30}}}$$

$$t = \frac{22}{8\sqrt{\frac{1}{15}}}$$

$t = 10.65$

So, t_{hitung} = 10.65

Step 5. Compare t_{hitung} and t_{tabel}

T_{tabel} = ta : db

db= $n_1 + n_2 - 2$

= $30 + 30 - 2$

= 58

At, $t_{tabel} = t_{0,05} : 58 = 2.01$

So, $t_{hitung} > t_{tabel}$

T_{hitung} (10.65) > t_{tabel} (2.01)

Step 6. Conclusion

The above calculation shows that t_{hitung} is greater than t_{tabel} then:

H_0 :There is no difference between student learning outcomes using Student Worksheet on Magnetism Matter Based Guided Inquiry with students who do not use Student Worksheet on Magnetism Matter Based Guided Inquiry(REFUSED)

H_a :There is a difference between student learning outcomes using magnetic force Student Worksheet on Magnetism Matter Based Guided Inquiry with students who do not use Student Worksheet on Magnetism Matter Based Guided Inquiry(ACCEPTED)

So that there is a significant difference between the students who use and do not use the Student Worksheet on Magnetism Matter Based Guided InquiryFurthermore, the average is known that the X_1 is higher than X_2 (2388>

1750), so it shows that the result of post -test experimental class better than the post-test control class. It shows that the Student Worksheet on Magnetism Matter Based Guided Inquiry for fifth grades can improve student learning outcomes in learning.

B. Data Analysis

This Student Worksheet is titled Student Worksheet on Magnetism Matter Based Guided Inquiry for grade V SD/ MI. The Student Worksheet has been tested on SDN Dinoyo 2 Malang, which consists of 30 students for the control class and 30 students for the experimental class. The development of Student Worksheet is done in accordance with the 2013 curriculum and characteristics of elementary school children (SD). According to Desmita the characteristics of elementary school students, children who love to play, move, enjoy working in groups, and enjoy feeling or doing something directly.

Therefore, teachers are expected to develop learning activities that provide direct experience to students. Selection of SDN Dinoyo 2 Malang based on the fact of unavailability of Student Worksheet on Magnetism Matter Based Guided Inquiry. In addition, there are some students who experience concept errors in magnetic force materials.

1. Develop Student Worksheet Analysis

The resulting product development is Student Worksheet on Magnetism Matter Based Guided Inquiry as a handbook of students and teachers of grade V SDN Dinoyo 2 Malang in achieving satisfactory learning outcomes. The final form of product development of Student Worksheet on Magnetism Matter Based Guided Inquiry as a handbook of students and teachers of grade V.

This Student Worksheet on Magnetism Matter Based Guided Inquiry is based on the fact that the unavailability of Guided Student-based Student Worksheets is based on the Curriculum of the 2013 Sub Theme of the Islamic Kingdom in Indonesia. Based on the conclusion of the interview with V-A class guardian Mrs. Nunik Martin Lestari, S.Pd who mentioned that it takes a Student Worksheet that helps students to carry out experimental activities properly and correctly so as not to experience a misconception.

The results of this development are intended to meet the availability of learning device that can improve student learning outcomes in SD/MI and enhance understanding of the concept. Student Worksheet on Magnetism Matter Based Guided Inquiry was developed to repair or add Student Worksheet as well as books that are already available.

2. Expert Validation Analysis

a. Material Expert Analysis

Here are the results of validation of data exposure that learning experts, in fifth grade against Student Worksheet on Magnetism Matter Based Guided Inquiry based on table 4.2 are as follows:

1) The suitability topic Student Worksheet is in accordance with the contents of the material. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet must have clear learning objectives as well as useful as a source of motivation.

2) The suitability of the material presented in the development of Students Worksheet is relevant and measuring capabilities. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet does not refer to the book resources beyond the capacity of the student legibility.
3) The suitability core competencies with indicators. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet must have clear learning objectives as well as useful as a source of motivation.
4) The suitability indicators presented with basic competencies to measure the ability. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* states that Student Worksheet must have good grammar lesson sequence corresponding to the level of student ability.
5) The suitability systematic very systematic description of the learning content. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* states that Student Worksheet must have good grammar lesson sequence corresponding to the level of student ability.
6) The suitability systematic content of Student Worksheet. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet must provide learning experiences that are determined by the student personal development purposes and is not determined by the material of lessons.

7) The accuracy material to gived understanding concept for students. This conformity is in line with Das Salirawati theory in *Penyusunan LKS dalam Proses Pembelajaran* which states that the pressure on the process encourages students to find the concepts and the use of Student Worksheet in expecting to be able to provide students learning experiences. The expected learning experience that arises after learning the Student Worksheet is to add to the student learning experience where the experience that students get, can be used to understand the basic concepts of magnetism.
8) The suitability of the work steps in clear and appropriate experimental activities. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good LKS has a variety of stimulus through various media and student activities. Student activities that appear in this Student Worksheet is an experimental activity based on guided inquiry.
9) The accuracy of the material presented to provide understanding of the concept to students very appropriate and relevant. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a goodStudent Worksheet provide sufficient space to provide flexibility to the students to write or draw answers on worksheets.
10) The accuracy of the addition SAMAK *(Soal Pemahaman Konsep)* in the Student Worksheet and relevant. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention

that a good Student Worksheet provide sufficient space to provide flexibility to the students to write or draw answers on worksheets.

11) The accuracy of the evaluation instrument *pre-test* and *post-test* used to measure the ability of students greatly. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet provide sufficient space to provide flexibility to the students to write or draw answers on worksheets.

12) The easy language used in the Student Worksheet is very appropriate. This conformity is in accordance with Das Salirawati theory in *Penyusunan LKS dalam Proses Pembelajaran* which states that good LKS uses simple and short sentences and uses clear sentence structure.

Questionnaire responses were filled by Mr Agus Mukti Wibowo, M.Pd as subject matter experts. Based on the results written above, obtained percentage of 93.75% are in a valid qualification so that the LKS does not need to be revised. The description indicates that Student Worksheet on Magnetism Matter Based Guided Inquiry is feasible to be used in accordance with the validation of the material expert.

b. Design Expert Analysis

Here are the results of validation of data exposure that design experts, in fifth grade against Student Worksheetmaterial guided inquiry based magnetic force based on table 4.3 are as follows:

1) Cover design is very appropriate to the content. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses*

Pembelajaran states that students will be interested in the appearance of Student Worksheet, not the contents. Therefore, the preparation or production of Student Worksheet cover made with interesting and appropriate to the content of the material.

2) Type font used very appropriate with the SD/MI students of class V. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using capital letters and not using Latin letters or roman and use a rather large bold letters on the topic, not regular letters that are underlined.
3) The font size that is used is very suitable with SD/MI students of class V. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using capital letters and not using Latin letters or roman and use a rather large bold letters on the topic, not regular letters that are underlined.
4) LKS images on very appropriate with material. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet is drawing on a worksheet can convey the message or the content of the image to the user particularly effective in Student Worksheet.
5) The image used is very relevant and very interesting interest students. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a goodStudent Worksheet is able to attract students and have a good combination between images and text.

6) The layout of images on a interesting and suitable. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet is able to attract students and have a good combination between images and text.
7) The images on the steps of the experiment are highly in accordance with the instructions of the working. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet is able to attract students and have a good combination between images and text.
8) The size of the image on Student Worksheet is right and very suitable. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet is to have clarity of the message or the content of the overall image. Therefore, an appropriate image size is required for the message delivered to be delivered properly.
9) The color on Student Worksheet is very consistent and systematic. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet is able to attract students and have a good combination between images and text. Images and writing also affect the color selection of Student Worksheet.
10) The interesting Student Worksheet Layout and suitable. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses*

Pembelajaran to mention that a good LKS is using frames to distinguish the command word with the students' answers.

Questionnaire responses were filled by Mr. Ahmad Abtokhi, M.Pd as design experts. Based on the results written above, the percentage of 95% is in the valid qualification so that the Student Worksheet does not need to be revised. The description indicates that Student Worksheet on Magnetism Matter Based guide Inquiry is feasible to be used in accordance with design expert validation.

c. Teaching Expert Analysis

Here are the results of validation of data exposure that teaching experts, in fifth grade against LKS material guided inquiry based magnetic force based on table 4.6 are as follows:

1) The cover design Student Worksheet is in accordance with the contents of the material. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* states that students will be interested in the appearance of Student Worksheet, not the contents. Therefore, the preparation or production of Student Worksheet cover made with interesting and appropriate to the content of the material.
2) The suitability of the material presented on the development of the student's Worksheet relevant and measuring capabilities. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran*to mention that a good Student Worksheet does not refer to the book resources beyond the capacity of the student legibility.

3) The suitability of indicators is presented with Basic Competence can measure ability. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet must have clear learning objectives as well as useful as a source of motivation.
4) The suitability of learning contents description systematics are very systematic. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* states that Student Worksheet must have good grammar lesson sequence corresponding to the level of student ability.
5) The clarity of the material clear and appropriate exposure. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet must provide learning experiences that are determined by the student's personal development purposes and is not determined by the material of lessons.
6) The work steps on the clarity of the experimental activities is clear and appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet has a variety of stimulus through various media and student activities. The activities of students in this Worksheet is to appear in the experimental activity-based guided inquiry.
7) The accuracy of the material presented can give understanding to the students is very appropriate and very relevant. This compliance is consistent with the

theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* mentions that the pressure in the process of pushing students to discover concepts and use of Student Worksheet is expected able to give the student learning experience. The learning experience that is expected to appear after learning LKS is to add to the student learning experience where the experience that students get, can be used to understand the basic concepts of magnetism.

8) The accuracy addition of SAMAK *(Soal Pemahaman Konsep)* on the Student Worksheet expanded feet according and relevant. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran*to mention that a good Student Worksheet provide sufficient space to provide flexibility to the students to write or draw answers on Student Worksheet.
9) The accuracy of evaluation instruments used are very able to measure students ability. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet provide sufficient space to provide flexibility to the students to write or draw answers on worksheets.
10) The ease of language used in the student Worksheet (LKS) very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.

Questionnaire responses filled by Mrs. Nunik Martin Lestari, S. Pd as a learning expert. Based on the results written above, obtained a percentage of

87.5% are in a valid qualification so that the Student Worksheet does not need to be revised. The description indicates that Student Worksheet on Magnetism Matter Based Guide Inquiryis feasible to be used in accordance with the validation of the learning expert.

d. Linguist Expert Analysis

Here are the results of validation of data exposure that teaching experts, in fifth grade against Student Worksheet on Magnetism Matter Based Guide Inquiry based on table 4.7 are as follows:

1) The suitability of language or sentence on the cover of the Student Worksheet very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.
2) The suitability of language or sentence on the Student Worksheet introduction very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.
3) The suitability of language/sentence on the Student Worksheet learning objectives very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.

4) The ease of language to be understood in the material the Student Worksheet very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.
5) The ease of language to understand experimental activities on Student Worksheet suitable. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.
6) The suitability of language used at point "Tugas Lanjutan" is very suitable. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.
7) The suitability of language used at point "Tahukah Kamu?" very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.
8) The suitability of the language used in the point "Seputar Pertanyaan" very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.

9) The suitability of language used at point "SAMAK (Soal Pemahaman Konsep)" very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.

10) The suitability language on evaluation very appropriate. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a goodStudent Worksheet using a simple and short sentences and use clear sentence structure.

Questionnaire responses were filled by Mr. Muh. Zuhdi Hamzah, S.S., M.Pd as a linguist. Based on the results written above, obtained a percentage of 97.5% are in a valid qualification so that the Student Worksheet does not need to be revised. The description indicates that Student Worksheet on Magnetism Matter Based Guided Inquiry is feasible to be used in accordance with the validation of the linguist.

3. Analysis of Data Validation Questionnaire

Based on the data contained in table 4.8, 4.9, questionnaire responses are filled by the subjects target that is all the students of grade V SDN Dinoyo 2 Malang Malang, which is divided into 2 stages: 1) small group evaluation and 2) trials field evaluation. The assessment of field trials on each component as the data that has been analyzed quantitatively in table 4.9, following trials field evaluation data:

a. The Student Worksheet easy you study, from the statement obtained the assessment with a percentage of 93%. This statement is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* states that LKS can develop communication skills sosisal, emotional, moral and aesthetic on students.
b. The Student Worksheet give you spirit when you study, from the statement obtained the assessment with a percentage of 93%. This statement is in accordance with the theory of Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* which states that the good Student Worksheet should have clear learning objectives and useful as a source of motivation.
c. The easily understand material in Student Worksheet, from the statement obtained the assessment with a percentage of 87%. This statement is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet can be used for all students, whether slow or fast.
d. The questions of Student Worksheet not difficult to working, from the statement obtained the assessment with a percentage of 83%. This statement is in accordance with the theory of Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran*which states that good LKS provides enough room to give flexibility to students to write answers or draw on LKS.
e. The type of font and size in Student Worksheet interesting, from the statement obtained the assessment with a percentage of 90%. This statement is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses*

Pembelajaran to mention that a good Student Worksheet using capital letters and not using Latin letters or roman and use a rather large bold letters on the topic, not regular letters that are underlined.

f. There is no difficult word in Student Worksheet, from the statement obtained the assessment with a percentage of 82%. This statement is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using a simple and short sentences and use clear sentence structure.

g. The instruction in experiments suitable, from the statement obtained the assessment with a percentage of 88%. This compliance is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet is able to attract students and have a good combination between images and text.

h. The easily of language that used, from the statement obtained the assessment with a percentage of 93%. This statement is consistent with the theory Das Salirawati in *Penyusunan LKS dalam Proses Pembelajaran* to mention that a good Student Worksheet using the language according to the maturity level of the students.

i. The experiments activity help you to collaborate with friends, from the statement obtained the assessment with a percentage of 94%. This statement is consistent with the theory Desmita in *Psikologi Perkembangan Peserta Didik* who says that students are very happy to do something as a group.

j. The colour and picture in Student Worksheet interest, from the statement obtained the assessment with a percentage of 88%. This statement is consistent with the theory Das Salirawati in *Psikologi Perkembangan Peserta Didik* states that students will be interested in the appearance of Student Worksheet, not the contents. Therefore, the preparation or production of Student Worksheet cover made with interesting and appropriate to the content of the material.

Questionnaire responses were filled by students of SDN Dinoyo 2 Malang, amounting to 30 students. Based on the results written above, obtained percentage of 89% are in valid qualifications so that Student Worksheet does not need to be revised. The description indicates that Student Worksheet on Magnetism Matter Based Guided Inquiry is suitable for use in the learning process.

4. The Result of Pre-Test and Post-Test Data Analysis

Based on the data in Table 4.10, the pre-test and post-test results for VA class students or experimental class in SDN Dinoyo 2 Malang showed that the average pre-test score was 46 and the post-test average was 80 be based on the number average or mean post-test, showed that there is a significant of understanding as many as 34. Simultaneously reinforced from t-test analysis which shows that t_{hitung} = 10,65 is bigger than t_{tabel}= 2,01. The conclusion is that Ho is rejected and Ha accepted, so there is a significant difference between the result of understanding before and after the use of LKS based on inquiry-based magnetic force. It can be said that the guided inquiry-based magnetic force LKS is able to effectively improve the understanding on science lesson of the class V students.

C. The Product Revision

1. Revised Content Expert Development Products

Based on the criticism and suggestions from the content expert validator in table 4.2, it can be seen in the following explanation:

a. Re-examining the concepts or materials provided for elementary students,
b. Fixed the Language used to make it easier for users,
c. Cover open repaired in order to attract students attention,
d. Layout for LKS needs to be improved in order to facilitate the user,
e. Can be used as a research.

2. Revised Content Expert Development Products

a. The choice of color should not be too soft to be able to read well,
b. Header / footer select the appropriate material,
c. The layout of the experimental activity should not confuse users,
d. Image size is not too big or not too small,
e. Replace the cover by selecting an image that matches the material to be delivered.

Picture 4.15 Before Revision and After Revision

CHAPTER V

CLOSING

A. Conclusion

Based on the development process and final test of Student Worksheet on Magnetism Matter Based Guided Inquiry class V SDN Dinoyo 2 Malang can be described as follows:

1. Development of Student Worksheet presents several experiments on magnetic force material in which each experiment is given a question to lead the student in solving a problem then the student will answer the question from the result of the experimental activity he has done. Student Worksheet on Magnetism Matter Based Guided Inquiry is also equipped with material concepts, the history of the magnet in the column you know and accompanied by the concept of understanding. Student Worksheet developed also has fulfilled the component as a good Student Worksheet to be used because in accordance with KI-KD, according to the character of the student, the language used is easily understood by the students so that the students will more easily understand the material contained in the Student Worksheet, the color selection is also adjusted and not too lit, the presentation of the material is equipped with the appropriate picture, the size and type of letters used are the letters commonly used in children's story books and thematic books so students do not get bored using the Student Worksheet and make students eager while following the learning process.

2. The validation result of the development of Student Worksheet on Magnetism Matter Based Guided Inquiryhas a high level of validity. Based on the results of the responses to criticism and suggestions from experts validator material / content, design experts, linguists and experts in learning. Here are the results of the validation of the experts:
   a. Response assessment from the material expert obtained a percentage of validity and reached 93.75%
   b. Assessment responses from design experts earn a percentage of validity and reach 95%
   c. Assessment response from linguists obtained a percentage of validity and reached 97.5%
   d. The assessment response from the learning expert gained a percentage of prevalence and reached 87.5%
3. The result of student learning outcomes based on field test of grade V SDN Dinoyo 2 Malang as measured by using achievement test of learning result. Based on the analysis that has been done, show that t_{hitung} (10.65)> t_{table} (2.01) so it can be concluded that there is a significant difference to the increase of magnetic force learning outcomes, by using Student Worksheet on Magnetism Matter Based Guided Inquiry for class V in SDN Dinoyo 2 Malang. That's because this Student Worksheet on Magnetism Matter Based Guided Inquiryhas an interesting design according to the characteristics of the students of SD/ MI. For experimental activities designed as simple as possible and in accordance with the environmental conditions of students, making it easier for

students to experiment. The existing concepts, developed in accordance with the material, so that students can compare the results of their thinking with concept, and finally understand the concept of the right material. Furthermore, students are given evaluation questions which is a measure of ability after doing the learning, so by using this experimental book students understanding of the concept of the material can be improved properly.

B. Suggestions

1. Suggestion to Product's Utilization

Student Worksheet can be used by all teachers of SD/ MI grade V for Student Worksheet has been in accordance with the Curriculum of 2013 expects teachers can create or use learning media to support teaching and learning.

Here are some suggestions related to product utilization purposes:

a. Student Worksheet is arranged according to the characteristics of students, so that students are expected to use it independently.
b. Student Worksheet on Magnetism Matter Based Guided Inquiryis not only source of student learning, teachers should encourage students to read other relevant sources.

2. Suggestion to Product's Dissemination

Student Worksheet is based on field conditions, namely, in SDN Dinoyo 2 Malang, there are no Student Worksheets. Student Worksheet on Magnetism Matter Based Guided Inquiryfor fifth grade SD/ MI was tested in SDN Dinoyo 2 Malang to know the difference of students who have used these worksheets to those not using it. VA class as experimental class and VB class as control class.

Based on the results obtained from the field that there is a different level of understanding of the concept seen from the results of pre-test and post-test given to students of class VA and VB.

The development of this Student Worksheet on Magnetism Matter Based Guided Inquirydoes not undertake the dissemination phase of the product. However, if it is desirable for some dissemination process to consider, this Student Worksheet is based on the characteristics of SDN Dinoyo 2 Malang students. If you want to reproduce, should be revised in accordance with the characteristics of other users.

3. Suggestion to Product's Further Developing

Based on the record during the trial that has been implemented, then for advanced developers and to optimize the utilization of Student Worksheet, provide suggestions as follows:

a. Product development has been made small revisions in accordance with the advice validator and student users. However, to further improve the quality of Student Worksheetshould be further revised so that Student Worksheet will be developed more perfect.
b. Student Worksheet is limited only to magnetic force material therefore, should be developed for other materials in IPA learning.

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APPENDIXIES

KEMENTERIAN AGAMA
UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM MALANG
FAKULTAS ILMU TARBIYAH DAN KEGURUAN
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http:// fitk.uin-malang.ac.id. email : fitk_uinmalang@yahoo.com

Nomor : Un.3.1/TL.00.1/006/2017 03 Januari 2017
Sifat : Penting
Lampiran : -
Hal : **Izin Penelitian**

Kepada
Yth. Kepala SDN Dinoyo 2 Malang
di
Malang

Assalamu'alaikumWr. Wb.

Dengan hormat, dalam rangka menyelesaikan tugas akhir berupa penyusunan skripsi mahasiswa Fakultas Ilmu Tarbiyah dan Keguruan (FITK) Universitas Islam Negeri Maulana Malik Ibrahim Malang, kami mohon dengan hormat agar mahasiswa berikut:

Nama	:	Niken Farida Hanum
NIM	:	13140024
Jurusan	:	Pendidikan Guru Madrasah Ibtidaiyah (PGMI)
Semester – Tahun Akademik	:	Ganjil - 2016/2017
Judul Skripsi	:	**Developing of Student Worksheet (LKS) Based Guide Inquiry on Magnetism Matter Sub Theme Islamic Kingdom In Indonesia to Understanding of Concept for Fifth Grade Students at SDN Dinoyo 2 Malang**

diberi izin untuk melakukan penelitian di lembaga/instansi yang menjadi wewenang Bapak/Ibu.

Demikian, atas perkenan dan kerjasama Bapak/Ibu yang baik disampaikan terima kasih.

Wassalamu'alaikum Wr. Wb.

an Dekan
Wakil Dekan Bid. Akademik,

Dr. Hj. Sulalah, M.Ag
NIP. 19651112 199403 2 002

Tembusan :
1. Yth. Ketua Jurusan PGMI
2. Arsip

PEMERINTAH KOTA MALANG
DINAS PENDIDIKAN
SD NEGERI DINOYO 2 NO. 255
Kecamatan Lowokwaru
Jl. MT Haryono IX/ 326 Telepon : (0341) 581196 Malang
Fax. (0341) 581196 email : tu.sdndinoyo2@gmail.com

SURAT KETERANGAN

Nomor : 074/VI/157/35.73.307.05/2017

Yang bertanda tangan di bawah ini:

Nama	: RATNANINGSIH, S. Pd
NIP	: 19600416 197907 2 004
Pangkat / Gol	: Pembina Tk. I, IV/b
Jabatan	: Kepala SDN Dinoyo 2 Kecamatan Lowokwaru Kota Malang

dengan ini menerangkan bahwa:

Nama	: Niken Farida Hanum
NIM	: 13140024
Program Studi	: S1 PGMI
Fakultas	: Ilmu Tarbiyah dan Keguruan
Judul Skripsi	: Developing of Student Worksheet (LKS) Based Guide Inquiry on Magnestim Matter Sub Theme Islamic Kingdom in Indonesia to Understanding of Concept for Fifth Grade Student at SDN Dinoyo 2 Malang.

Mahasiswa Universitas Islam Negeri Malang tersebut diatas telah melaksanakan kegiatan pengambilan data mengenai Developing of Student Worksheet (LKS) Based Guide Inquiry on Magnestim Matter Sub Theme Islamic Kingdom in Indonesia to Understanding of Concept for Fifth Grade Student at SDN Dinoyo 2 Malang Kec. Lowokwaru Kota Malang pada bulan Januari s.d April 2017 untuk memenuhi tugas mata kuliah Skripsi.

Demikian surat keterangan ini dibuat, untuk dipergunakan sebagaimana mestinya.

Malang, 12 April 2017
Kepala SDN Dinoyo 2 Malang

PEMERINTAH KOTA MALANG
SDN DINOYO 2
KEC. LOWOKWARU
DINAS PENDIDIKAN

RATNANINGSIH, S. Pd
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MAULANA MALIK IBRAHIM
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EVIDENCE OF CONSULTATION

Name : Niken Farida Hanum
Number of Student : 13140024
Departement : Islamic Primary Teacher Education Program
Advisor : Dr. Muhammad Walid, MA
Title of Skripsi : Developing of Student Worksheet (LKS) based Guide Inquiry on Magnetism Matter Sub Theme Islamic Kingdom in Indonesia to Understanding of Concept for Fifth Grade Students at SDN Dinoyo 2 Malang

No.	Date of Consultation	Consultation Material	Signature
1	December 1st, 2016	Chapter I	
2	December 15th, 2016	Chapter II	
3	January 12th, 2017	Chapter III	
4	February 8th, 2017	Material Validation	
5	April 17th, 2017	Field Evaluation	
6	April 27th, 2017	Chapter IV	
7	May 5th, 2017	Data Analysis	
8	May 8th, 2017	Chapter V	

Acknowledege by,
Head of Departement,

Dr. Muhammad Walid, MA
NIP. 19730823 20003 1 002

INSTRUMEN VALIDASI AHLI ISI MATA PELAJARAN SAINS
"DEVELOPING OF STUDENT WORKSHEET (LKS)
BASED GUIDE INQUIRY ON MAGNETISM MATTER SUB THEME
ISLAMIC KINGDOM IN INDONESIA TO UNDERSTANDING OF
CONCEPT FOR FIFTH GRADE AT SDN DINOYO 2 MALANG "

A. Pengantar

Berkaitan dengan pelaksanaan pengembangan Lembar Kerja Siswa (LKS) berbasis Inkuiri Terbimbing pada Materi Kemagnetan Sub Tema Kerajaan Islam di Indonesia untuk Meningkatkan Pemahaman Konsep Siswa Kelas V SDN Dinoyo 2 Malang, maka peneliti bermaksud mengadakan validasi Lembar Kerja Siswa (LKS) yang telah diproduksi sebagai salah satu bahan pembelajaran. Oleh sebab itu, peneliti mohon kesediaan Bapak untuk mengisi angket di bawah ini sebagai ahli isi. Tujuan dari pengisian angket adalah mengetahui kesesuaian pemanfaatan Lembar Kerja Siswa (LKS) ini sebagaimana yang telah dirancang berdasarkan disiplin ilmu sains. Hasil dari pengukuran melalui angket akan digunakan untuk penyempurnaan Lembar Kerja Siswa (LKS) agar dapat dimanfaatkan dalam pembelajaran. Sebelumnya saya sampaikan terima kasih atas kesediaan Bapak sebagai ahli isi mata pelajaran sains.

Nama : Agus Mukti Wibowo
NIP : 19780707 200801 1 021
Instansi : PGMI UIN Malang
Pendidikan : S2 UM
Alamat : Muara Sarana Indah F-29 Jetis Dau

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Bapak/Ibu membaca petunjuk pengisian berikut ini.

1. Cermatilah secara keseluruhan produk Lembar Kerja Siswa (LKS) yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (√) pada SS, S, TS dan STS sesuai dengan penilaian Bapak.

2. Pedoman penilaian

Jawaban	Keterangan	Skor
SS	Sangat Sesuai	4
S	Sesuai	3
TS	Tidak Sesuai	2
STS	Sangat Tidak Sesuai	1

3. Selain memberikan skor, mohon Bapak juga menuliskan kritik dan saran pada lembar yang telah disediakan.

C. Berilah tanda centang (√) pada alternatif jawaban yang dianggap paling sesuai.

No.	Pernyataan	Penilaian			
		SS	S	TS	STS
1.	Kesesuaian rumusan topik pada pengembangan lembar kerja siswa (LKS)		√		
2.	Kesesuaian materi yang disajikan pada pengembangan lembar kerja siswa (LKS)		√		
3.	Kesesuaian kompetensi inti dengan indikator		√		
4.	Kesesuaian indikator yang disajikan dengan kompetensi dasar		√		
5.	Kesesuaian sistematika uraian isi pembelajaran		√		
6.	Kejelasan paparan materi		√		

7.	Ketepatan materi yang disajikan dapat memberi pemahaman konsep kepada siswa		✓		
8.	Kesesuaian kegiatan eksperimen dengan pembahasan	✓			
9.	Ketepatan instrument evaluasi yang digunakan dapat mengukur kemampuan siswa		✓		
10.	Ketepatan penambahan SAMAK (Soal Pemahaman Konsep) pada Lembar Kerja Siswa (LKS)	✓			
11.	Kesesuaian antara instrument pre-test dan post-test terhadap materi yang dibahas		✓		
12.	Kemudahan bahasa yang digunakan dalam Lembar Kerja Siswa (LKS)			✓	

D. Kritik

Perbaikan isi materi LKS

" bahasa yang digunakan

E. Saran

Magnet < bahasa
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Malang, Januari 2017

Agus Mukti Wibowo, M.Pd
NIP. 19780707 200801 1 021

INSTRUMEN VALIDASI AHLI ISI MATA PELAJARAN SAINS
"DEVELOPING OF STUDENT WORKSHEET (LKS)
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Pendidikan :S2 UM
Alamat :Muara Sarana Indah F-29 Jetis Dau

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Bapak/Ibu membaca petunjuk pengisian berikut ini.

1. Cermatilah secara keseluruhan produk Lembar Kerja Siswa (LKS) yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (√) pada SS, S, TS dan STS sesuai dengan penilaian Bapak.

2. Pedoman penilaian

Jawaban	Keterangan	Skor
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S	Sesuai	3
TS	Tidak Sesuai	2
STS	Sangat Tidak Sesuai	1

3. Selain memberikan skor, mohon Bapak juga menuliskan kritik dan saran pada lembar yang telah disediakan.

C. Berilah tanda centang (√) pada alternatif jawaban yang dianggap paling sesuai.

No.	Pernyataan	Penilaian			
		SS	S	TS	STS
1.	Kesesuaian rumusan topik pada pengembangan lembar kerja siswa (LKS)	√			
2.	Kesesuaian materi yang disajikan pada pengembangan lembar kerja siswa (LKS)	√			
3.	Kesesuaian kompetensi inti dengan indikator	√			
4.	Kesesuaian indikator yang disajikan dengan kompetensi dasar	√			
5.	Kesesuaian sistematika uraian isi pembelajaran		√		
6.	Kejelasan paparan materi	√			

7.	Ketepatan materi yang disajikan dapat memberi pemahaman konsep kepada siswa	✓			
8.	Kesesuaian kegiatan eksperimen dengan pembahasan	✓			
9.	Ketepatan instrument evaluasi yang digunakan dapat mengukur kemampuan siswa		✓		
10.	Ketepatan penambahan SAMAK (Soal Pemahaman Konsep) pada Lembar Kerja Siswa (LKS)	✓			
11.	Kesesuaian antara instrument pre-test dan post-test terhadap materi yang dibahas	✓			
12.	Kemudahan bahasa yang digunakan dalam Lembar Kerja Siswa (LKS)		✓		

D. Kritik

tpp lebih diperbaiki, lebih rapi

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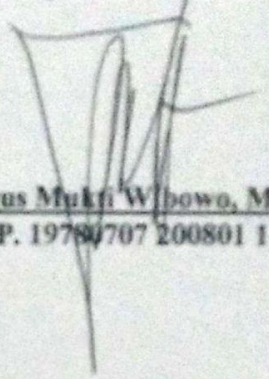
E. Saran

tpp lebih lebih rapi

Malang, Januari 2017



Agus Mukti Wibowo, M.Pd
NIP. 19780707 200801 1 021

I

INSTRUMEN VALIDASI AHLI DESAIN LEMBAR KERJA SISWA (LKS)
"DEVELOPING OF STUDENT WORKSHEET (LKS)
BASED GUIDE INQUIRY ON MAGNETISM MATTER SUB THEME
ISLAMIC KINGDOM IN INDONESIA TO UNDERSTANDING OF
CONCEPT FOR FIFTH GRADE AT SDN DINOYO 2 MALANG "

A. Pengantar

Berkaitan dengan pelaksanaan pengembangan Lembar Kerja Siswa (LKS) berbasis Inkuiri Terbimbing Materi Gaya Magnet pada Sub Tema Kerajaan Islam di Indonesia Untuk siswa Kelas V SD/ MI, maka peneliti bermaksud mengadakan validasi Lembar Kerja Siswa (LKS) yang telah diproduksi sebagai salah satu bahan pembelajaran. Oleh sebab itu, peneliti mohon kesediaan Bapak/Ibu untuk mengisi angket di bawah ini sebagai ahli desain media pembelajaran. Tujuan dari pengisian angket adalah mengetahui kesesuaian pemanfaatan media pembelajaran ini sebagaimana yang telah dirancang berdasarkan disiplin ilmu sains. Hasil dari pengukuran melalui angket akan digunakan untuk penyempurnaan media pembelajaran agar dapat dimanfaatkan dalam pembelajaran. Sebelumnya saya sampaikan terima kasih atas kesediaan Bapak sebagai ahli desain media pembelajaran.

Nama	:Ahmad Abtokhi
NIP	:197610032003122001
Instansi	:Fisika / PGMI UIN Malang
Pendidikan	:S2 UNESA
Alamat	:Sumpil 2 Barat kav. A5 Blimbing

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Bapak membaca petunjuk pengisian berikut ini.

1. Cermatilah secara keseluruhan produk Lembar Kerja Siswa (LKS) yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (√) pada angka SS, S, TS dan STS sesuai dengan penilaian Bapak.

2. Pedoman penilaian

Jawaban	Keterangan	Skor
SS	Sangat Sesuai	4
S	Sesuai	3
TS	Tidak Sesuai	2
STS	Sangat Tidak Sesuai	1

3. Selain memberikan skor, mohon Bapak/Ibu juga menuliskan saran-saran pada lembar yang telah disediakan.

C. Berilah tanda centang (√) pada alternatif jawaban yang dianggap paling sesuai.

No.	Pernyataan	Penilaian			
		SS	S	TS	STS
1.	Desain cover sesuai dengan isi materi		√		
2.	Jenis huruf yang digunakan sesuai dengan siswa SD/MI kelas V		√		
3.	Ukuran huruf yang digunakan sesuai dengan siswa SD/MI kelas V		√	√	
4.	Gambar pada Lembar Kerja Siswa (LKS) sesuai dengan materi		√		
5.	Gambar yang digunakan menarik minat siswa		√		
6.	Tata letak gambar pada Lembar Kerja Siswa (LKS) menarik			√	
7.	Gambar pada langkah eksperimen telah sesuai dengan petunjuk kerja			√	
8.	Ukuran gambar pada Lembar Kerja Siswa (LKS) tepat		√		
9.	Warna pada buku konsisten		√		
10.	*Layout*/tata letak pada buku menarik		√		

D. Kritik

1. Desain cover depan kanan-kiri tidak mengesankan LKS
2. Pewarnaan daftar isi tidak terlihat
3. Dalam kata pengantar, awalnya tidak boleh ada kata "Untuk..."
4. Tugas lanjutan tidak seharusnya ada icon lampu

E. Saran

1. Inkuiri Terbimbing diawali pertanyaan dan tergawab pada kesimpulan
2. Gambar 4 (tidak perlu di Bold.

Malang, Januari 2017

Ahmad Abhtokhi, M.Pd
NIP. 19761003 200312 2 001

INSTRUMEN VALIDASI AHLI DESAIN LEMBAR KERJA SISWA (LKS)
"DEVELOPING OF STUDENT WORKSHEET (LKS)
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Nama	:Ahmad Abtokhi
NIP	:197610032003122001
Instansi	:Fisika / PGMI UIN Malang
Pendidikan	:S2 UNESA
Alamat	:Sumpil 2 Barat kav. A5 Blimbing

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Bapak membaca petunjuk pengisian berikut ini.

1. Cermatilah secara keseluruhan produk Lembar Kerja Siswa (LKS) yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (√) pada angka SS, S, TS dan STS sesuai dengan penilaian Bapak.

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6.	Tata letak gambar pada Lembar Kerja Siswa (LKS) menarik		√		
7.	Gambar pada langkah eksperimen telah sesuai dengan petunjuk kerja	√			
8.	Ukuran gambar pada Lembar Kerja Siswa (LKS) tepat	√			
9.	Warna pada buku konsisten	√			
10.	*Layout*/tata letak pada buku menarik		√		

D. Kritik

Desain sudah bagus dan dapat diujicobakan

E. Saran

Dirapikan lagi untuk kegiatan eksp. dan pemberian materi

Malang, Januari 2017

Ahmad Abhtokhi, M.Pd
NIP. 19761003 200312 2 001

INSTRUMEN VALIDASI AHLI BAHASA

"DEVELOPING OF STUDENT WORKSHEET (LKS) BASED GUIDE INQUIRY ON MAGNETISM MATTER SUB THEME ISLAMIC KINGDOM IN INDONESIA TO UNDERSTANDING OF CONCEPT FOR FIFTH GRADE AT SDN DINOYO 2 MALANG "

A. Pengantar

Berkaitan dengan pelaksanaan pengembangan Lembar Kerja Siswa (LKS) berbasis Inkuiri Terbimbing pada Materi Kemagnetan Sub Tema Kerajaan Islam di Indonesia untuk Meningkatkan Pemahaman Konsep Siswa Kelas V SDN Dinoyo 2 Malang, maka peneliti bermaksud mengadakan validasi Lembar Kerja Siswa (LKS) yang telah diproduksi sebagai salah satu bahan pembelajaran. Oleh sebab itu, peneliti mohon kesediaan Bapak untuk mengisi angket di bawah ini sebagai ahli bahasa. Tujuan dari pengisian angket adalah mengetahui kesesuaian pemanfaatan Lembar Kerja Siswa (LKS) ini sebagaimana yang telah dirancang berdasarkan disiplin ilmu sains. Hasil dari pengukuran melalui angket akan digunakan untuk penyempurnaan Lembar Kerja Siswa (LKS) agar dapat dimanfaatkan dalam pembelajaran. Sebelumnya saya sampaikan terima kasih atas kesediaan Bapak sebagai ahli bahasa.

Nama	: Muh. Zuhdy Hamzah, S.S., M.Pd
NIP	: 198012112015031001
Instansi	: PGMI UIN Malang
Pendidikan	: S2

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Bapak/Ibu membaca petunjuk pengisian berikut ini.

1. Cermatilah secara keseluruhan produk Lembar Kerja Siswa (LKS) yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (√) pada jawaban SS, S, TS dan STS sesuai dengan penilaian Bapak.

2. Pedoman penilaian

Jawaban	Keterangan	Skor
SS	Sangat Sesuai	4
S	Sesuai	3
TS	Tidak Sesuai	2
STS	Sangat Tidak Sesuai	1

3. Selain memberikan skor, mohon Bapak juga menuliskan kritik dan saran pada lembar yang telah disediakan.

C. Berilah tanda silang (√) pada alternatif jawaban yang dianggap paling sesuai.

No.	Pernyataan	Penilaian			
		SS	S	TS	STS
1	Kesesuaian bahasa/kalimat pada cover Lembar Kerja Siswa (LKS)	✓			
2	Kesesuaian bahasa/kalimat pada kata pengantar Lembar Kerja Siswa (LKS)	✓			
3	Kesesuaian bahasa/kalimat pada tujuan pembelajaran Lembar Kerja Siswa (LKS)	✓			
4	Kemudahan bahasa untuk dipahami dalam materi Lembar Kerja Siswa (LKS)	✓			
5	Kemudahan bahasa untuk dipahami pada kegiatan eksperimen Lembar Kerja Siswa (LKS)	✓			
6	Kesesuaian bahasa yang digunakan pada point "Tugas Lanjutan"		✓		
7	Kesesuaian bahasa yang digunakan pada point				

No.	Pernyataan	Penilaian			
		SS	S	TS	STS
	"Tahukah Kamu"	✓			
8	Kesesuaian bahasa yang digunakan pada point "Seputar Pertanyaan"	✓			
9	Kesesuaian bahasa yang digunakan pada point "SAMAK (Soal Pemahaman Konsep)"	✓			
10	Kesesuaian bahasa pada evaluasi	✓			

D. Kritik

Penyajian sampulnya masih memberlukan kombinasi gambar dan kata yang lebih variatif dan menarik

E. Saran

Sebaiknya dalam mengasah kemampuan berpikir siswa melalui LKS diberikan bentuk pengelompokan pertanyaan-pertanyaan yang lebih merangsang stimulator berpikir siswa

Malang, Januari 2017

Muh. Zuhdy Hamzah, S.S., M.Pd
NIP. 198012112015031001

INSTRUMEN VALIDASI AHLI PEMBELAJARAN
"DEVELOPING OF STUDENT WORKSHEET (LKS)
BASED GUIDE INQUIRY ON MAGNETISM MATTER SUB THEME
ISLAMIC KINGDOM IN INDONESIA TO UNDERSTANDING OF
CONCEPT FOR FIFTH GRADE AT SDN DINOYO 2 MALANG "

A. Pengantar

Berkaitan dengan pelaksanaan pengembangan Lembar Kerja Siswa (LKS) berbasis Inkuiri Terbimbing pada Materi Kemagnetan Sub Tema Kerajaan Islam di Indonesia untuk Meningkatkan Pemahaman Konsep Siswa Kelas V SDN Dinoyo 2 Malang, maka peneliti bermaksud mengadakan validasi Lembar Kerja Siswa (LKS) yang telah diproduksi sebagai salah satu bahan pembelajaran. Oleh sebab itu, peneliti mohon kesediaan Ibu untuk mengisi angket di bawah ini sebagai ahli pembelajaran. Tujuan dari pengisian angket adalah mengetahui kesesuaian pemanfaatan Lembar Kerja Siswa (LKS) ini sebagaimana yang telah dirancang berdasarkan disiplin ilmu sains. Hasil dari pengukuran melalui angket akan digunakan untuk penyempurnaan Lembar Kerja Siswa (LKS) agar dapat dimanfaatkan dalam pembelajaran. Sebelumnya saya sampaikan terima kasih atas kesediaan Ibu sebagai ahli pembelajaran.

Nama	:	Nunik Martin Lestari, S.Pd
NIP	:	19670926199403 2006
Instansi	:	SDN DINOYO 2 MALANG
Pendidikan	:	S1
Alamat	:	Bumi Aji, Batu

B. Petunjuk Pengisian Angket

Sebelum mengisi angket silakan Ibu membaca petunjuk pengisian berikut ini.

1. Cermatilah secara keseluruhan produk Lembar Kerja Siswa (LKS) yang dikembangkan, kemudian isilah lembar penilaian dengan memberikan tanda (√) pada angka 1,2,3 dan 4 sesuai dengan penilaian Bapak/ Ibu.

2. Pedoman penilaian

Jawaban	Keterangan	Skor
SS	Sangat Sesuai	4
S	Sesuai	3
TS	Tidak Sesuai	2
STS	Sangat Tidak Sesuai	1

3. Selain memberikan skor, mohon Ibu juga menuliskan saran-saran pada lembar yang telah disediakan.

C. Berilah tanda silang (√) pada alternatif jawaban yang dianggap paling sesuai.

No.	Pernyataan	Penilaian			
		SS	S	TS	STS
1.	Desain cover Lembar Kerja Siswa (LKS). sesuai dengan isi materi	√			
2.	Kesesuaian materi yang disajikan pada pengembangan Lembar Kerja Siswa (LKS).		√		
3.	Kesesuaian Indikator yang disajikan dengan Kompetensi Dasar.		√		
4.	Kesesuaian sistematika uraian isi pembelajaran.	√			
5.	Kejelasan paparan materi.		√		
6.	Kejelasan langkah kerja pada kegiatan eksperimen.		√		
7.	Ketepatan materi yang disajikan dapat memberikan pemahaman konsep kepada siswa.	√			

8.	Ketepatan penambahan SAMAK (Soal Pemahaman Konsep) pada Lembar Kerja Siswa (LKS).		✓		
9.	Ketepatan instrumen evaluasi yang digunakan dapat mengukur kemampuan siswa.	✓			
10.	Kemudahan bahasa yang digunakan dalam Lembar Kerja Siswa (LKS).	✓			

D. Kritik

Desain sampul supaya lebih masuk kedunia anak-anak.

E. Saran

Kegiatan siswa disesuaikan dengan jam tetap mata pembelajaran karena pembelajaran tematik.

Malang, Januari 2017

Nunik Martin Lestari, S.Pd

NIP. 196709261994032006

7

ANGKET TANGGAPAN/PENILAIAN SISWA UJI COBA LAPANGAN LEMBAR KERJA SISWA (LKS) MATERI GAYA MAGNET

A. Petunjuk Pengisian Angket

Sebelum mengisi angket silahkan membaca petunjuk pengisian berikut ini.

1. Isilah lembar penilaian dengan memberikan tanda (√) pada SS, S, TS dan STS sesuai dengan penilaianmu
2. Pedoman penilaian

Jawaban	Keterangan
SS	Sangat Sesuai
S	Sesuai
TS	Tidak Sesuai
STS	Sangat Tidak Sesuai

B. Berilah tanda centang (√) pada alternatif jawaban yang dianggap paling sesuai.

No.	Pertanyaan	Penilaian			
		SS	S	TS	STS
1.	Lembar Kerja Siswa (LKS) ini dapat memudahkan kamu dalam belajar				
2.	Lembar Kerja Siswa (LKS) ini dapat memberi semangat dalam belajarmu				
3.	Mudah memahami materi yang ada di dalam Lembar Kerja Siswa (LKS)				
4.	Soal-soal pada Lembar Kerja Siswa (LKS) ini tidak sulit untuk di kerjakan				
5.	Jenis huruf dan ukuran huruf yang terdapat dalam Lembar Kerja Siswa (LKS) ini menarik				

6.	Di dalam Lembar Kerja Siswa (LKS) ini tidak ada kata-kata yang sulit				
7.	Petunjuk yang terdapat dalam kegiatan eksperimen sesuai				
8.	Bahasa yang digunakan mudah dipahami				
9.	Kegiatan eksperimen pada Lembar Kerja Siswa (LKS) ini membantumu untuk bekerjasama dengan teman				
10.	Warna dan gambar pada Lembar Kerja Siswa (LKS) ini menarik				

Terima Kasih

PRE-TEST

Nama :

Kelas/No. Absen :

Nilai:

A. Berilahtandasilang (X) padahuruf a, b, c, atau d denganjawaban yang benar!

1. Berikut ini adalah benda-benda yang tidak dapat ditarik oleh magnet....
   a. Kaca
   b. paku
   c. jarum
   d. penjepit kertas
2. Jika kita mendekatkan dua kutub magnet yang berbeda, maka ....
   a. tarik-menarik
   b. diam
   c. tarik dan menolak
   d. tolak-menolak
3. Benda-benda berikut yang mempunyai sifat magnetis adalah ....
   a. paku, tusuk gigi, kunci
   b. gunting, buku, cincin
   c. buku, pensil, penggaris
   d. jarum, paku, penjepit kertas
4. Kekuatan magnet yang terbesar terletak pada bagian ....
   a. Atas
   b. kutub
   c. bawah
   d. samping
5. Berikut ini benda yang cara kerjanya memanfaatkan gaya magnet adalah ....
   a. kompor listrik
   b. kipas angin
   c. bel listrik
   d. setrika listrik

6. Berikut ini yang bukan merupakan ciri magnet adalah ....
    a. memiliki dua kutub
    b. dapat menarik semua logam
    c. tarik menarik jika tak sejenis
    d. tolak menolak jika sejenis
7. Salah satu cara menghilangkan magnet adalah ....
    a. paku digosok dengan magnet searah
    b. paku dipukul-pukul
    c. paku didekatkan dengan magnet
    d. paku dililit kawat tembaga dan dialiri listrik
8. Sifat kemagnetan benda pada tiga cara membuat magnet bersifat ....
    a. Kekal
    b. abadi
    c. sementara
    d. hilang
9. Benda digolongkan dalam feromagnetik karena ... oleh gaya magnet.
    a. ditarik kuat
    b. tidak dapat ditarik
    c. ditarik lemah
    d. tidak kuat ditarik
10. Logam yang dapat ditarik oleh gaya magnet adalah kecuali, ...
    a. nikel
    b. aluminium
    c.besi
    d. baja

B. Jawablah uraian di bawah ini dengan benar !

1. Tuliskan 3 contoh penggunaan magnet dalam kehidupan sehari-hari!

.....

.....

2. Jelaskanapa yang dimaksuddengangaya magnet?

.....

.....

3. Sebutkan 3 macam bentuk magnet yang kamu ketahui!

.....

.....

4. Apakah kutub selatan magnet bumi dan kutub selatan bumi berada di pada arah yang sama? Jelaskan!

.....

.....

5. Pintu dan badan lemari es dilapisi dengan bantalan plastik atau karet.Mengapa pintu dan badan lemari es tetap bisa tarik-menarik?

.....

.....

POST-TEST

Nama :

Kelas/No. Absen :

Nilai:

A. Berilahtandasilang (X) padahuruf a, b, c, atau d denganjawaban yang benar!

1. Berikut ini adalah benda-benda yang dapat ditarik oleh magnet, kecuali ....
   e. paku
   f. jarum
   g. penjepit kertas
   h. uang koin Rp 500
2. Jika kita mendekatkan dua kutub magnet yang senama, maka ....
   e. diam
   f. tarik-menarik
   g. tarik dan menolak
   h. tolak-menolak
3. Benda-benda berikut yang mempunyai sifat non-magnetis adalah ....
   e. paku, kaca, kunci
   f. obeng, paku, gunting
   g. buku, pensil, penggaris
   h. gunting, buku, cincin
4. Kekuatan magnet yang terbesar terletak pada bagian ....
   e. atas
   f. kutub
   g. bawah
   h. samping
5. Berikut ini benda yang cara kerjanya memanfaatkan gaya magnet adalah ....

e. kompor listrik
f. kipas angin
g. bel listrik
h. setrika listrik

6. Salah satu ciri magnet adalah ....
   e. Tolak menolak jika sejenis
   f. tarik menarik jika sejenis
   g. gaya tarik terbesar berada pada bagian tengah magnet
   h. memiliki satu kutub
7. Salah satu cara membuat magnet adalah ....
   e. memukul paku dengan magnet
   f. paku digosokan pada kutub batu baterai
   g. paku ditempelkan pada karet yang dialiri listrik
   h. paku dililit kawat tembaga dan dialiri listrik
8. Salah satu cara membuat magnet adalah dengan menggosok secara ....
   e. bolak-balik
   f. tidak beraturan
   g. searah
   h. acak
9. Benda digolongkan dalam sifat diamagnetik karena ... oleh gaya magnet.
   a. ditarik kuat
   b. tidak dapat ditarik
   c. ditarik lemah
   d. ditarik kuat sekali
10. Logam yang dapat ditarik oleh gaya magnet adalah ...
   a. nikel
   b. aluminium
   c. perak
   d. tembaga

B. Jawablah uraian di bawah ini dengan benar !

1. Sebutkan 3 ciri magnet yang berbeda dengan benda lainnya!

.....

.....

2. Sebutkan 3 cara membuat magnet!

.....

.....

3. Sebutkan 3 macam bentuk magnet yang kamu ketahui!

.....

.....

4. Apakah kutub selatan magnet bumi dan kutub selatan bumi berada di pada arah yang sama? Jelaskan!

.....

.....

5. Berdasarkan sifat kemagnetannya, benda digolongkan menjadi 3 jenis, sebutkan!

.....

.....

RENCANA PELAKSANAAN PEMBELAJARAN

(RPP)

Nama Sekolah	: SD Negeri Dinoyo 2 Malang
Kelas	: V
Semester	: 2
Tema	: 7 (Sejarah Peradaban Indonesia)
Subtema	: 1 (Kerajaan Islam di Indonesia)
Pembelajaran	: 1 (KD 3.5, 4.4 dan 4.5)
Alokasi Waktu	: 2 x 35 menit
Pelaksanaan	: Rabu, 8 Februari 2017

A. Kompetensi Inti

1. Menerima dan menjalankan ajaran agama yang dianutnya.
2. Memiliki perilaku jujur, disiplin, tanggung jawab, santun, peduli, dan percaya diri
   dalam berinteraksi dengan keluarga, teman, dan guru.
3. Memahami pengetahuan faktual dengan cara mengamati (mendengar, melhiat, membaca) dan menanya berdasarkan rasa ingin tahu tentang dirinya, makluk ciptaan Tuhan dan kegiatannya,dan benda-benda yang dijumpainya di rumah, dan sekolah.
4. Menyajikan pengetahuan faktual dalam bahasa yang jelas, dan logis alam karya yang estetis, dalam gerakan yang mencerminkan anak sehat, dan dalam tindakan yang mencerminkan perilaku anak bermain dan berakhlak mulia.

B. Kompetensi Dasar dan Indikator

Kompetensi Dasar	Indikator
3.5 Mengenal rangkaian listrik sederhana dan sifat magnet serta penerapannya dalam kehidupan sehari-hari	3.4.1 Siswa dapat memahami sifat dan ciri magnet 3.4.2 Siswa dapat mengidentifikasi manfaat magnet dalam kehidupan sehari-hari
4.4 Membuat kompas sederhana untuk mendeteksi medan magnet bumi	4.4.1 Siswa dapat membuat kompas sederhana untuk menentukan arah bumi 4.4.2 Siswa dapat menggunakan kompas sederhana 4.4.3 Siswa dapat menyebutkan arah mata angin dengan menggunakan kompas sederhana
4.5 Membuat elektromagnet sederhana dan menggunakannya untuk mendeteksi benda-benda yang ditarik oleh magnet	4.5.1 Siswa dapat membuat magnet sederhana

C. Tujuan Pembelajaran:

1. Dengan melakukan eksperimen terhadap beberapa benda disekitar, siswa dapat mengetahui dan memberi contoh penggolongan benda berdasarkan sifat kemagnetannya
2. Dengan melakukan percobaan terhadap beberapa benda disekitar, siswa dapat menyebutkan dan mengidentifikasi benda-benda disekitar yang menggunakan magnet
3. Dengan melakukan kegiatan praktek langsung membuat kompas sederhana, siswa dapat menentukan arah mata angin
4. Dengan berdiskusi dengan teman kelompok, siswa dapat membuat magnet dari bahan-bahan disekitar siswa

D. Materi Pembelajaran

1. Fakta

   Penggunaan Magnet dalam kehidupan sehari-hari

2. Konsep

   Memahami sifat dan ciri magnet

3. Prosedural

Langkah membuat magnet:

a. Menggosok
b. Mengalirkan arus listrik
c. Menginduksi magnet

4. Keterkaitan Pengetahuan

Mampu membuat magnet sederhana dari bahan-bahan sederhana dilingkungan sekitar

E. Pendekatan Pembelajaran

Pendekatan : *Scientific learning*

Metode :Cooperative learning dan eksperimen

Teknik : Diskusi kelompok dan presentasi

Model :Inkuiri Terbimbing

F. Langkah-Langkah Pembelajaran

Kegiatan	**Deskripsi Kegiatan**	**Alokasi Waktu**
Pendahuluan	1. Guru membuka pelajaran dengan mengucap salam dan menanyakan kabar siswa 2. Siswa berdoa disentral dari kantor oleh siswa yang telah dijadwalkan (do'a belajar, asmaul husna, ayat kursi) 3. Siswa menyanyikan lagu-lagu nasional 4. Siswa menyanyikan lagu mars SDN Dinoyo 2 Malang 5. Siswa hormat kepada bendera merah-putih 6. Guru menyapa siswa dan menjelaskan tujuan pembelajaran, batas-batas tugas serta penilaiannya yang akan dilakukan siswa 7. Guru memotivasi siswa dengan menunjukkan benda-benda disekitar siswa yang cara memanfaatkan gaya magnet	20 Menit

Inti	1. Guru membagi siswa menjadi lima kelompok dengan nama kelompok sebagai berikut A. Kelompok Merah B. Kelompok Kuning C. Kelompok Hijau D. Kelompok Orange E. Kelompok Biru F. Kelompok Ungu G. Kelompok Hitam H. Kelompok Putih 2. Setiap kelompok menunjuk salah satu orang untuk ditunjuk menjadi ketua kelompok 3. Ketua kelompok mengambil "BEKAL" yang akan digunakan untuk kegiatan eksperimen 4. Guru menjelaskan prosedur eksperimen yang akan dilakukan secara berkelompok/ *team work* 5. Siswa diajak untuk bersepakat dalam menentukan waktu kegiatan eksperimen pada "Lembar Kerja Siswa Gaya magnet" 6. Pada Eksperimen I, siswa akan melakukan eksperimen memahami sifat magnet 7. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 8. Secara acak kelompok yang telah menyelesaikan kegiatan eksperimen terlebih dahulu mempresentasikan hasilnya dan kelompok lain memperhatikan dan menanggapi 9. Pada Eksperimen II, siswa akan melakukan eksperimen membuktikan gaya tarik-menarik antar magnet 10. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 11. Secara acak kelompok yang terlambat menyelesaikan kegiatan eksperimen mempresentasikan hasilnya dan kelompok lain	35 menit

	memperhatikan dan menanggapi 12. Pada Eksperimen III-V, siswa akan melakukan eksperimen membuat magnet dengan cara menggosok, dialiri arus listrik dan induksi 13. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 14. Secara acak guru mengambil *lotre* untuk kelompok yang mempresentasikan hasilnya dan dan kelompok lain memperhatikan dan menanggapi 15. Pada Eksperimen VI, siswa akan melakukan eksperimen membuat kompas sederhana 16. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 17. Secara acak guru mengambil *lotre* untuk kelompok yang mempresentasikan hasilnya dan dan kelompok lain memperhatikan dan menanggapi 18. Pada kegiatan eksperimen I-VI guru akan menjelaskan materi yang telah disampaikan 19. Guru mengumumkan hasil kelompok yang juara dan memberi reward 20. Siswa berlatih soal evaluasi 21. Siswa bersama guru memberikan kesimpulan	
Penutupan	1. Siswa melakukan refleksi pembelajaran dengan menjawab pertanyaan yang diberikan oleh guru 2. Siswa melakukan refleksi pembelajaran tentang materi yang belum dipahami 3. Guru memberikan penekanan konsep kepada siswa tentang materi yang telah dipelajari 4. Guru memberikan pesan moral pentingnya bekerja sama dengan teman dan berbuat baik agar lebih baik dalam bersikap 5. Sebelum pembelajaran diakhiri,	15 menit

	siswa menyanyikan lagu daerah 6. Ketua kelas memimpin doa sebelum pulang 7. Guru menutup pelajaran dengan mengucap salam	

G. Penilaian

1. Penilaian Melakukan Kegiatan Eksperimen secara Berkelompok sesuai dengan Prosedur dengan teknik obeservasi (menggunakan daftar tanda cek)

Observasi

No.	Nama Kelompok	Eksperimen I		Eksperimen II		Eksperimen III		Eksperimen IV		Eksperimen V		Eksperimen VI	
		T	BT	T	BT	T	BT	T	BT	T	BT	T	BT
1.	Merah												
2.	Kuning												
3.	Hijau												
4.	Orange												
5.	Biru												
6.	Ungu												
7.	Hitam												
8.	Putih												

Keterangan:

T : Terlihat

BT : Belum Terlihat

Rubrik Penilaian

Terlihat (√)	Belum Terlihat (√)
Membaca prosedur atau langkah-langkah pada kegiatan eksperimen dengan benar dan berurutan	Membaca prosedur atau langkah-langkah pada kegiatan eksperimen belum benar dan belum berurutan

2. Penilaian Melakukan Kegiatan Eksperimen Percobaan Magnet dengan teknik obeservasi (menggunakan skala penilaian)

No.	Nama Siswa	Kriteria			Total Nilai (maks. 12)
		Pengetahuan	Ketrampilan Melakukan Percobaan	Sikap Rasa Ingin Tahu dan Kecermatan Siswa	
1.	Aamira Faheena G				
2.	Achmad Royfi El H				
3.	Anggito Galih A				
4.	Aurellia Athallah				
5.	Clarissa Arintya A				
6.	Clarista Aurelia A				
7.	Cornelia Chyntia L				
8.	Dhimas Sukma M				
9.	Elgha Radhitya A				
10.	Fatah Rozaan Y				
11.	Febriana Eka Sa				
12.	Firfil Zifana N				
13.	Ivena Fariza R				
14.	Kalinda Armitafari				
15.	Keishya Aliffia				
16.	Mutiara Karina H				
17.	Nabila Alifia R				
18.	Neisyah Alidya Z				

No.	Nama Siswa	Kriteria			Total Nilai (maks. 12)
		Pengetahuan	Ketrampilan Melakukan Percobaan	Sikap Rasa Ingin Tahu dan Kecermatan Siswa	
19.	Olivia Chelsea M				
20.	Pradiva Titha A				
21.	Rakay Pikatan P				
22.	Ramadhan Octavian				
23.	Reika Amalia S				
24.	Rendrian Rizaldhi				
25.	Rinoe Hilmi Naufal				
26.	Rizqullah Akbar R				
27.	Sabilla Zahwa K				
28.	Saffanah Azka Z				
29.	Vonnylia Julian P				
30.	Fyela Wahyu F				

Rubrik Eksperimen Magnet

Kompetensi yang dinilai:

- Pengetahuan siswa tentang sifat magnet dan ciri-ciri magnet
- Ketrampilan siswa melakukan eksperimen, membuat dugaan dan menyusun kesimpulan
- Sikap rasa ingin tahu dan kecermatan siswa

Kriteria	Baik Sekali	Baik	Cukup	Perlu Bimbingan
	4	3	2	1
Pengetahuan	Pengetahuan siswa tentang sifat dan ciri-ciri magnet terlihat sangat jelas dalam percobaan yang ia lakukan	Siswa terlihat hanya menguasai dua dari tiga konsep sifat dan ciri-ciri magnet	Siswa terlihat hanya menguasa dua dari tiga konsep sifat dan ciri-ciri magnet itupun dengan bantuan teman sekelompoknya	Siswa masih membutuhkan bantuan untuk memahami seluruh konsep sifat dan ciri-ciri magnet
Ketrampilan melakukan percobaan	Seluruh siswa dalam kelompok memiliki keterampilan yang sangat baik dalam melakukan percobaan, membuat dugaan sebelum percobaan yang dilakukan serta menyusun kesimpulan dari hasil percobaan	Seluruh siswa dalam kelompok memiliki keterampilan yang cukup baik dalam melakukan percobaan, membuat dugaan sebelum percobaan yang dilakukan serta menyusun kesimpulan dari hasil percobaan	Seluruh siswa dalam kelompok memiliki keterampilan yang masih perlu ditingkatkan dalam melakukan percobaan, membuat dugaan sebelum percobaan yang dilakukan serta menyusun kesimpulan dari hasil percobaan	Guru banyak memberikan bantuan saat seluruh siswa dalam kelompok melakukan percobaan, membuat dugaan serta menyusun kesimpulan hasil percobaan
Sikap rasa ingin tahu dan kecermatan siswa	Seluruh anggota terlihat bersungguh-sungguh, menunjukkan rasa ingin tahu dan kecermatan	Seluruh anggota terlihat menunjukkan rasa ingin tahu dan kecermatan, walaupun beberapa diantaranya terlihat kurang bersungguh-sungguh	Seluruh anggota terlihat menunjukkan rasa ingin tahu walaupun banyak diantaranya terlihat kurang bersungguh-sungguh	Seluruh anggota masih harus terus diingatkan agar bersungguh-sungguh dan cermat saat melakukan percobaan

3. Penilaian Melakukan Kegiatan Eksperimen Membuat Elektromagnet Sederhana dengan teknik obeservasi (menggunakan skala penilaian)

No.	Nama Siswa	Kriteria				Total Nilai (maks. 12)
		Pengetahuan	Ketrampilan Mencari Informasi	Sikap Rasa Ingin Tahu dan Ketekunan Siswa	Sikap Percaya Diri	
1.	Aamira Faheena					
2.	Achmad Royfi El					
3.	Anggito Galih A					
4.	Aurellia Athallah					
5.	Clarissa Arintya					
6.	Clarista Aurelia					
7.	Cornelia Chyntia					
8.	Dhimas Sukma					
9.	Elgha Radhitya A					
10.	Fatah Rozaan Y					
11.	Febriana Eka Sa					
12.	Firfil Zifana N					
13.	Ivena Fariza R					
14.	Kalinda A					
15.	Keishya Aliffia					
16.	Mutiara Karina H					
17.	Nabila Alifia R					
18.	Neisyah Alidya Z					

No.	Nama Siswa	Kriteria				Total Nilai (maks. 12)
		Pengetahuan	Ketrampilan Mencari Informasi	Sikap Rasa Ingin Tahu dan Ketekunan Siswa	Sikap Percaya Diri	
19.	Olivia Chelsea M					
20.	Pradiva Titha A					
21.	Rakay Pikatan P					
22.	Ramadhan O					
23.	Reika Amalia S					
24.	Rendrian R					
25.	Rinoe Hilmi N					
26.	Rizqullah Akbar					
27.	Sabilla Zahwa K					
28.	Saffanah Azka Z					
29.	Vonnylia Julian P					
30.	Fyela Wahyu F					

Rubrik Eksperimen Magnet

Kompetensi yang dinilai:

- Pengetahuan siswa tentang membuat magnet
- Ketrampilan siswa dalam mencari informasi
- Sikap rasa ingin tahu dan ketekunan siswa dalam bekerja
- Sikap percaya diri siswa saat menyajikan informasi secara lisan

Kriteria	Baik Sekali	Baik	Cukup	Perlu Bimbingan
	4	3	2	1
Pengetahuan	Pengetahuan siswa tentang cara membuat magnet terlihat menyeluruh dan detail	Pengetahuan siswa tentang cara membuat magnet cukup baik dan jelas	Pengetahuan siswa tentang cara membuat magnet masih terlihat kurang menyeluruh	Siswa masih membutuhkan bantuan untuk memahami informasi tentang cara membuat magnet
Ketrampilan mencari informasi	Seluruh anggota memiliki keterampilan yang sangat baik dalam mencari informasi sehubungan dengan cara membuat magnet	Seluruh anggota memiliki keterampilan yang baik dalam mencari informasi sehubungan dengan cara membuat magnet	Sebagian kecil anggota memiliki keterampilan yang kurang baik dan kurang menyeluruh dalam mencari informasi sehubungan dengan cara membuat magnet	Sebagian besar anggota memiliki keterampilan yang kurang baik dan kurang menyeluruh dalam mencari informasi sehubungan dengan cara membuat magnet
Sikap rasa ingin tahu dan ketekunan siswa	Seluruh anggota terlihat sangat bersungguh-sungguh dan menunjukkan rasa ingin tahu yang sangat tinggi	Seluruh anggota terlihat cukup bersungguh-sungguh dan menunjukkan rasa ingin tahu	Hampir sebagian besar anggota terlihat cukup bersungguh-sungguh namun masih kurang menunjukkan rasa ingin tahu	Sebagian dari anggota kelompok terlihat kurang bersungguh-sungguh dan kurang tekun dalam mencari informasi
Sikap Percaya Diri	Siswa menunjukkan sikap yang penuh percaya diri saat	Siswa menunjukkan sikap yang cukup percaya diri saat melakuka	Siswa menunjukkan sikap yang kurang percaya diri saat melakukan	Siswa menunjukkan sikap yang malu-malu dan terlihat tidak percaya diri saat melakukan

Kriteria	Baik Sekali	Baik	Cukup	Perlu Bimbingan
	4	3	2	1
	melakukan presentasi informasi di depan kelas	presentasi informasi di depan kelas	presentasi informasi di depan kelas	presentasi informasi di depan kelas

H. Materi

1. Pengertian Gaya Magnet

Kata magnet berasal dari bahasa Yunani maghnithis lithos yang berarti batu magnesian. Magnesian adalah nama wilayah di Yunani tempat ditemukannya batu magnet, di tempat inilah bangsa Yunani menemukan sifat magnetik dari bebatuan yang mampu menarik biji besi.

Magnet adalah bahan yang dapat menarik beberapa logam tertentu. Magnet berasal dari batuan yang mengandung logam besi. Magnet buatan terbuat dari batuan logam tersebut diolah sampai akhirnya menjadi magnet. Tarikan atau dorongan yang disebabkan oleh magnet disebut gaya magnet.

Magnet hanya dapat menarik logam-logam tertentu. Logam dari besi, nikel dan kobalt dapat ditarik oleh magnet. Ketika logam tersebut ditarik oleh magnet, logam itu akan bergerak dan menghasilkan gaya magnet. Gerak logam menuju magnet tersebut membutuhkan energi dari magnet.

Logam dari aluminium, perak, dan tembaga tidak dapat ditarik oleh magnet karena logam tersebut tidak memiliki sifat kemagnetan. Magnet pun tidak dapat menarik benda-benda yang bukan logam, seperti plastik, kertas, dan daun.

2. Membuktikan Sifat Magnet

Kita dapat menemui berbagai macam benda yang menggunakan gaya magnet. Tidak semua benda mengalami gaya magnet. Benda yang menerima gaya magnet dikatakan bersifat magnetis. Benda yang menolak gaya magnet dikatakan bersifat non-magnetis.

Ada benda yang dapat ditarik kuat oleh magnet. Ada benda yang ditarik lemah oleh magnet. Ada pula benda yang tidak dapat ditarik oleh magnet. Berdasarkan sifat kemagnetannya, benda digolongkan menjadi 3 jenis, yaitu:

(d) Feromagnetik, yaitu benda yang memiliki sifat kemagnetan kuat.

(e) Paramagnetik,yaitu benda yang memiliki sifat kemagnetan lemah.

(f) Diamagnetik, yaitu benda yang tidak memiliki sifat kemagnetan

3. Membuat Magnet

Magnet dapat dibedakan menjadi dua jenis, yaitu magnet alam dan magnet buatan. Magnet alam berasal dari alam. Magnet buatan dibuat oleh manusia. Cara membuat magnet ada tiga yaitu:

1. Menggosok

Sifat kemagnetan dapat diberikan pada benda dengan cara menggosokkan besi. Semakin banyak gosokan yang dilakukan, semakin kuat sifat kemagnetannya. Cara menggosoknya dengan arah gosokan searah. Contohnya jarum di gosok searah secara berulang-ulang dengan magnet maka, jarum tersebut akan menjadi magnet.

2. Mengalirkan arus listrik

Magnet dapat dibuat dengan cara mengalirkan listrik pada lilitan kawat logam. Semakin banyak lilitan, semakin kuat sifat kemagnetannya. Magnet yang dibuat dengan cara memberi aliran listrik disebut elektromagnet. Cara membuat magnetnya dengan cara melilitkan kawat tembaga pada paku dan dua sisi kawat tembaga dibersihkan hingga terlihat warna putih lalu ujungnya ditempelkan pada betrei dengan menggunakan selotip.

3. Menginduksi magnet.

Pembuatan magnet dengan cara induksi adalah dengan mendekatkan logam pada magnet. Logam itu akan mempunyai sifat seperti magnet. Contoh menginduksi magnet adalah paku di dekatkan pada magnet, maka paku yang sebelumnya tidak dapat menarik jarum akan dapat menarik jarum.

4. Membuat Kompas Sederhana

Sebuah magnet yang bebas bergerak ternyata selalu menempatkan dirinya menurut arah utara-selatan. Hal ini menunjukkan bahwa di permukaan Bumi terdapat medan magnet dan gaya yang mempengaruhi kutub-kutub magnet tersebut. Kutub utara magnet selalu menghadap ke arah utara. Hal ini dapat dijelaskan bahwa:

1. Di kutub Utara bumi terdapat suatu kutub selatan magnet
2. Di kutub selatan bumi terdapat suatu kutub utara magnet
3. Bumi ialah sebuah magnet besar dengan kutub selatan magnet terletak di kutub utara bumi dan kutub utara magnet terletak di dekat kutub selatan bumi.

5. Manfaat Magnet

Dalam kehidupan sehari-hari magnet memberi banyak manfaat. Ada beberapa alat rumah tangga yang menggunakan magnet. Sebagai contoh adalah pintu kulkas (lemari es). Kompas, gunting jahit, dan tempat pensil bermagnet merupakan contoh lain pemanfaatan gaya magnet.

Malang, 8 Februari 2017

Mahasiswa Praktikan,

Niken Farida Hanum
NIM.13140024

RENCANA PELAKSANAAN PEMBELAJARAN

(RPP)

Nama Sekolah	: SD Negeri Dinoyo 2 Malang
Kelas	: V B
Semester	: 2
Tema	: 7 (Sejarah Peradaban Indonesia)
Subtema	: 1 (Kerajaan Islam di Indonesia)
Pembelajaran	: 1 (KD 3.5 dan 4.5)
Alokasi Waktu	: 1 hari
Pelaksanaan	: Selasa, 31 Januari 2017

I. Kompetensi Inti

5. Menerima dan menjalankan ajaran agama yang dianutnya.
6. Memiliki perilaku jujur, disiplin, tanggung jawab, santun, peduli, dan percaya diri
   dalam berinteraksi dengan keluarga, teman, dan guru.
7. Memahami pengetahuan faktual dengan cara mengamati (mendengar, melhiat, membaca) dan menanya berdasarkan rasa ingin tahu tentang dirinya, makluk ciptaan Tuhan dan kegiatannya,dan benda-benda yang dijumpainya di rumah, dan sekolah.
8. Menyajikan pengetahuan faktual dalam bahasa yang jelas, dan logis alam karya yang estetis, dalam gerakan yang mencerminkan anak sehat, dan dalam tindakan yang mencerminkan perilaku anak bermain dan berakhlak mulia.

J. Kompetensi Dasar dan Indikator

Kompetensi Dasar	Indikator
3.5 Mengenal rangkaian listrik sederhana dan sifat magnet serta penerapannya dalam kehidupan sehari-hari	3.5.1 Siswa dapat menyebutkan ciri-ciri magnet
4.5 Membuat elektromagnet sederhana dan menggunakannya untuk mendeteksi benda-benda yang ditarik oleh magnet	4.5.1 Siswa mengumpulkan informasi mengenai cara membuat elektromagnet sederhana

K. Tujuan Pembelajaran:

5. Dengan melakukan percobaan sederhana, siswa mampu menyebutkan ciri-ciri benda yang bersifat magnetis dan tidak magnetis dengan rasa ingin tahu
6. Dengan berdiskusi kelompok dan mencari informasi, siswa mampu mengumpulkan informasi mengenai cara membuat elektromagnet sederhana dengan tekun

L. Materi Pembelajaran

5. Fakta

   Mengumpulkan informasi tentang cara membuat elektromagnet sederhana

6. Konsep

   Memahami benda yang bersifat magnetis dan tidak magnetis

7. Prosedural

   Langkah percobaan magnet:

   d. Menentukan arah magnet
   e. Menentukan keadaan kutub magnet jika didekatkan
   f. Menentukan kutub magnet dengan potongan magnet
   g. Mengidentifikasi sifat-sifat benda magnetis

8. Keterkaitan Pengetahuan

   Mampu mengumpulkan informasi dari berbagai sumber cara membuat elektromagnet sederhana

M. Pendekatan Pembelajaran

Pendekatan : *Scientific learning*

Metode :Cooperative learning dan percobaan

Teknik : Diskusi kelompok dan presentasi

N. Langkah-Langkah Pembelajaran

Kegiatan	**Deskripsi Kegiatan**	**Alokasi Waktu**
Pendahuluan	8. Guru membuka pelajaran dengan mengucap salam dan menanyakan kabar siswa 9. Siswa berdoa disentral dari kantor oleh siswa yang telah dijadwalkan (do'a belajar, asmaul husna, ayat kursi) 10. Siswa menyanyikan lagu-lagu nasional 11. Siswa menyanyikan lagu mars SDN Dinoyo 2 Malang 12. Siswa hormat kepada bendera merah-putih 13. Guru menyapa siswa dan menjelaskan tujuan pembelajaran, batas-batas tugas serta penilaiannya yang akan dilakukan siswa 14. Guru memotivasi siswa dengan menunjukkan benda-benda disekitar siswa yang cara memanfaatkan gaya magnet	20 Menit
Inti	22. Guru membagi siswa menjadi lima kelompok dengan nama kelompok sebagai berikut A. Kelompok Merah B. Kelompok Kuning C. Kelompok Hijau D. Kelompok Orange E. Kelompok Biru F. Kelompok Ungu G. Kelompok Coklat H. Kelompok Putih 23. Setiap kelompok menunjuk salah	35 menit

Kegiatan	Deskripsi Kegiatan	Alokasi Waktu
	satu orang untuk ditunjuk menjadi ketua kelompok 24. Ketua kelompok mengambil "BEKAL" yang akan digunakan untuk kegiatan eksperimen 25. Guru menjelaskan prosedur percobaan yang akan dilakukan secara berkelompok/*team work* 26. Siswa diajak untuk bersepakat dalam menentukan waktu kegiatan percobaan 27. Pada Percobaan I, siswa akan melakukan percobaan tentang hubungan arah magnet dengan kutub bumi 28. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 29. Secara acak kelompok yang telah menyelesaikan kegiatan percobaan terlebih dahulu mempresentasikan hasilnya dan kelompok lain memperhatikan dan menanggapi 30. Pada Percobaan II, siswa akan melakukan percobaan terhadap dua buah kutub magnet 31. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 32. Secara acak kelompok yang terlambat menyelesaikan kegiatan percobaan mempresentasikan hasilnya dan kelompok lain memperhatikan dan menanggapi 33. Pada Percobaan III, siswa akan melakukan percobaan tentang sifat magnet yang dipotong akan memiliki dua kutub 34. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 35. Secara acak kelompok yang telah menyelesaikan kegiatan percobaan terlebih dahulu mempresentasikan	

Kegiatan	Deskripsi Kegiatan	Alokasi Waktu
	hasilnya dan kelompok lain memperhatikan dan menanggapi 36. Pada Percobaan IV, siswa akan melakukan percobaan terhadap sifat dan ciri-ciri benda magnetis dan akibatnya benda tersebutkan jika didekatkan pada magnet 37. Guru akan membantu siswa untuk melakukan langkah kegiatan secara berurutan 38. Secara acak kelompok yang terlambat menyelesaikan kegiatan percobaan mempresentasikan hasilnya dan kelompok lain memperhatikan dan menanggapi 39. Pada percobaan V, secara individu siswa melakukan kegiatan membuat eloktramagnetik sederhana dengan mengamati contoh yang dilakukan oleh guru 40. Siswa menuliskan langkah-langkah percobaan pada buku tugas 41. Secara acak siswa maju ke depan untuk mempresentasikan hasilnya 42. Guru mengumumkan hasil kelompok yang juara dan memberi reward 43. Siswa berlatih soal evaluasi 44. Siswa bersama guru memberikan kesimpulan	
Penutupan	8. Siswa melakukan refleksi pembelajaran dengan menjawab pertanyaan yang diberikan oleh guru 9. Siswa melakukan refleksi pembelajaran tentang materi yang belum dipahami 10. Guru memberikan penekanan konsep kepada siswa tentang materi yang telah dipelajari 11. Guru memberikan pesan moral pentingnya bekerja sama dengan teman dan berbuat baik agar lebih baik dalam bersikap 12. Sebelum pembelajaran diakhiri, siswa menyanyikan lagu daerah	15 menit

Kegiatan	Deskripsi Kegiatan	Alokasi Waktu
	13. Ketua kelas memimpin doa sebelum pulang 14. Guru menutup pelajaran dengan mengucap salam	

O. Penilaian

4. Penilaian Melakukan Kegiatan Percobaan secara Berkelompok sesuai dengan Prosedur dengan teknik obeservasi (menggunakan daftar tanda cek)

Observasi

No.	Nama Kelompok	Percobaan I		Percobaan II		Percobaan III		Percobaan IV		Total Nilai (maks. 8)	Nilai
		T	BT	T	BT	T	BT	T	BT		
1.	Merah										
2.	Kuning										
3.	Hijau										
4.	Orange										
5.	Biru										
6.	Ungu										
7.	Coklat										
8.	Putih										

$$\text{Nilai} = \frac{\text{Total Nilai siswa}}{\text{NilaiMaksimal.8}} \text{ x } 100$$

Keterangan:

T : Terlihat

BT : Belum Terlihat

Rubrik Penilaian

Terlihat (2)	Belum Terlihat (0)
Membaca prosedur atau langkah-langkah pada kegiatan eksperimen dengan benar dan berurutan	Membaca prosedur atau langkah-langkah pada kegiatan eksperimen belum benar dan belum berurutan

5. Penilaian Melakukan Kegiatan Eksperimen Percobaan Magnet dengan teknik obeservasi (menggunakan skala penilaian)

No.	Nama Siswa	Kriteria			Total Nilai (maks. 12)	Nilai
		Pengetahuan	Ketrampilan Melakukan Percobaan	Sikap Rasa Ingin Tahu dan Kecermatan Siswa		
1.	Abwabul Choir					
2.	Achmad Firdhan					
3.	Ahmad Fauzan Z					
4.	Aisyah Puji W					
5.	Aldira Syawal I					
6.	Amalia Nur S					
7.	Ammara F					
8.	Anindya S A					
9.	Annisa Nur H					
10.	Berliana D					
11.	Cello Afla Fauza					
12.	Clarissa Aurelia					
13.	Dhyfa Harpha V					
14.	Dicky Habib P					
15.	Gabrita Maghfira					
16.	Hasbullah R					
17.	Helmy Aminudin					
18.	Kyra Orleana W					
19.	Muhammad D					
20.	Mazzaluna R P Z					
21.	Mia Dwi Calista					
22.	M. Khoirussyifa’					

No.	Nama Siswa	Kriteria			Total Nilai (maks. 12)	Nilai
		Pengetahuan	Ketrampilan Melakukan Percobaan	Sikap Rasa Ingin Tahu dan Kecermatan Siswa		
23.	Muhammad Rizki					
24.	Najwa Syarifah T					
25.	Naysilla Dwi Y					
26.	Novagvinea F					
27.	Nyssa Achadia S					
28.	Raya Rizky R					
29.	Revania Audi Z					
30.	Salsa Billa Arum					
31.	Sofiah Fadhila Z					
32.	Zidan Sabana M					

$$\text{Nilai} = \frac{\text{Total Nilai siswa}}{\text{NilaiMaksimal.12}} \text{ x } 100$$

Rubrik Eksperimen Magnet

Kompetensi yang dinilai:

- Pengetahuan siswa tentang sifat magnet dan ciri-ciri magnet
- Ketrampilan siswa melakukan eksperimen, membuat dugaan dan menyusun kesimpulan
- Sikap rasa ingin tahu dan kecermatan siswa

Kriteria	Baik Sekali	Baik	Cukup	Perlu Bimbingan
	4	3	2	1
Pengetahuan	Pengetahuan siswa tentang sifat dan ciri-ciri magnet terlihat sangat jelas dalam percobaan yang ia lakukan	Siswa terlihat hanya menguasai dua dari tiga konsep sifat dan ciri-ciri magnet	Siswa terlihat hanya menguasa dua dari tiga konsep sifat dan ciri-ciri magnet itupun dengan bantuan teman sekelompoknya	Siswa masih membutuhkan bantuan untuk memahami seluruh konsep sifat dan ciri-ciri magnet
Ketrampilan melakukan percobaan	Seluruh siswa dalam kelompok memiliki keterampilan yang sangat baik dalam melakukan percobaan, membuat dugaan sebelum percobaan yang dilakukan serta menyusun kesimpulan dari hasil percobaan	Seluruh siswa dalam kelompok memiliki keterampilan yang cukup baik dalam melakukan percobaan, membuat dugaan sebelum percobaan yang dilakukan serta menyusun kesimpulan dari hasil percobaan	Seluruh siswa dalam kelompok memiliki keterampilan yang masih perlu ditingkatkan dalam melakukan percobaan, membuat dugaan sebelum percobaan yang dilakukan serta menyusun kesimpulan dari hasil percobaan	Guru banyak memberikan bantuan saat seluruh siswa dalam kelompok melakukan percobaan, membuat dugaan serta menyusun kesimpulan hasil percobaan
Sikap rasa ingin tahu dan kecermatan siswa	Seluruh anggota terlihat bersungguh-sungguh, menunjukkan rasa ingin tahu dan kecermatan	Seluruh anggota terlihat menunjukkan rasa ingin tahu dan kecermatan, walaupun beberapa diantaranya terlihat kurang bersungguh-sungguh	Seluruh anggota terlihat menunjukkan rasa ingin tahu walaupun banyak diantaranya terlihat kurang bersungguh-sungguh	Seluruh anggota masih harus terus diingatkan agar bersungguh-sungguh dan cermat saat melakukan percobaan

6. Penilaian Melakukan Kegiatan Eksperimen Membuat Elektromagnet Sederhana dengan teknik obeservasi (menggunakan skala penilaian)

No.	Nama Siswa	Kriteria				Total Nilai (maks. 16)	Nilai
		Pengetahuan	Ketrampilan Mencari Informasi	Sikap Rasa Ingin Tahu dan Ketekunan Siswa	Sikap Percaya Diri		
1.	Abwabul Choir						
2.	Achmad Firdhan						
3.	Ahmad Fauzan						
4.	Aisyah Puji W						
5.	Aldira Syawal I						
6.	Amalia Nur S						
7.	Ammara F						
8.	Anindya S A						
9.	Annisa Nur H						
10.	Berliana D						
11.	Cello Afla Fauza						
12.	Clarissa Aurelia						
13.	Dhyfa Harpha V						
14.	Dicky Habib P						
15.	Gabrita Maghfira						
16.	Hasbullah R						
17.	Helmy Aminudin						
18.	Kyra Orleana W						
19.	Muhammad D						
20.	Mazzaluna R P Z						
21.	Mia Dwi Calista						
22.	M. Khoirussyifa’						
23.	Muhammad R						
24.	Najwa Syarifah T						
25.	Naysilla Dwi Y						
26.	Novagvinea F						
27.	Nyssa Achadia S						

No.	Nama Siswa	Kriteria				Total Nilai (maks. 16)	Nilai
		Pengetahuan	Ketrampilan Mencari Informasi	Sikap Rasa Ingin Tahu dan Ketekunan Siswa	Sikap Percaya Diri		
28.	Raya Rizky R						
29.	Revania Audi Z						
30.	Salsa Billa Arum						
31.	Sofiah Fadhila Z						
32.	Zidan Sabana M						

$$\text{Nilai} = \frac{\text{Total Nilai siswa}}{\text{NilaiMaksimal.16}} \text{ x } 100$$

Rubrik Eksperimen Magnet

Kompetensi yang dinilai:

- Pengetahuan siswa tentang membuat magnet
- Ketrampilan siswa dalam mencari informasi
- Sikap rasa ingin tahu dan ketekunan siswa dalam bekerja
- Sikap percaya diri siswa saat menyajikan informasi secara lisan

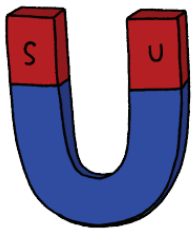
Kriteria	Baik Sekali	Baik	Cukup	Perlu Bimbingan
	4	3	2	1
Pengetahuan	Pengetahuan siswa tentang cara membuat magnet terlihat menyeluruh dan detail	Pengetahuan siswa tentang cara membuat magnet cukup baik dan jelas	Pengetahuan siswa tentang cara membuat magnet masih terlihat kurang menyeluruh	Siswa masih membutuhkan bantuan untuk memahami informasi tentang cara membuat magnet
Ketrampilan mencari informasi	Seluruh anggota memiliki keterampilan yang sangat baik dalam mencari	Seluruh anggota memiliki keterampilan yang baik dalam mencari informasi	Sebagian kecil anggota memiliki keterampilan yang kurang baik dan kurang	Sebagian besar anggota memiliki keterampilan yang kurang baik dan kurang

Kriteria	Baik Sekali	Baik	Cukup	Perlu Bimbingan
	4	3	2	1
	informasi sehubungan dengan cara membuat magnet	sehubungan dengan cara membuat magnet	menyeluruh dalam mencari informasi sehubungan dengan cara membuat magnet	menyeluruh dalam mencari informasi sehubungan dengan cara membuat magnet
Sikap rasa ingin tahu dan ketekunan siswa	Seluruh anggota terlihat sangat bersungguh-sungguh dan menunjukkan rasa ingin tahu yang sangat tinggi	Seluruh anggota terlihat cukup bersungguh-sungguh dan menunjukkan rasa ingin tahu	Hampir sebagian besar anggota terlihat cukup bersungguh-sungguh namun masih kurang menunjukkan rasa ingin tahu	Sebagian dari anggota kelompok terlihat kurang bersungguh-sungguh dan kurang tekun dalam mencari informasi
Sikap Percaya Diri	Siswa menunjukkan sikap yang penuh percaya diri saat melakukan presentasi informasi di depan kelas	Siswa menunjukkan sikap yang cukup percaya diri saat melakuka presentasi informasi di depan kelas	Siswa menunjukkan sikap yang kurang percaya diri saat melakukan presentasi informasi di depan kelas	Siswa menunjukkan sikap yang malu-malu dan terlihat tidak percaya diri saat melakukan presentasi informasi di depan kelas

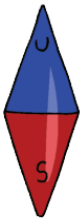
P. Materi

Magnet merupakan suatu objek yang memiliki medan magnet. Kata magnet berasal dari bahasa Yunani magnithis lithos yang berarti batu magnesian. Magnesian adalah nama wilayah di Yunani tempat ditemukannya batu magnet.

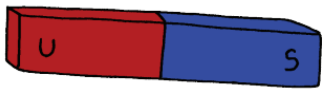
Berbagai Bentuk Magnet



Magnet Tapal Kuda



Magnet Jarum



Magnet Batang

Percobaan I

Tujuan: hubungan arah magnet dengan kutub bumi

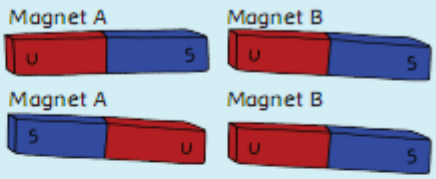
Percobaan pertama

Ambillah magnet batang.
Putar sekencang-kencangnya magnet batang tersebut di atas meja.
Amatilah kedua ujung magnet tersebut setelah berhenti berputar.
Ke manakah arah kedua ujung magnet tersebut?
Lakukan berulang-ulang.
Tuliskan hasilnya pada kolom berikut.

Ciri magnet pertama

Percobaan kedua

Ambilah dua buah magnet batang.
Dekatkan antara kutub utara magnet A dengan kutub utara magnet B.
Catatlah apa yang terjadi.



Dekatkan antara kutub selatan magnet A dengan kutub selatan magnet B.
Catatlah apa yang terjadi.

Lakukan berulang-ulang.
Tuliskan hasilnya pada kolom berikut.

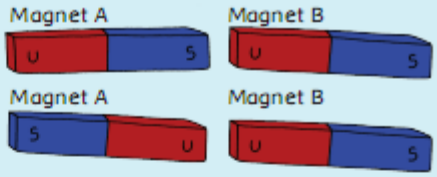
Ciri magnet kedua

Percobaan II

Tujuan: mendekatkan dua buah magnet dengan kutub yang berbeda

Percobaan kedua

Ambilah dua buah magnet batang.
Dekatkan antara kutub utara magnet A dengan kutub utara magnet B.
Catatlah apa yang terjadi.



Dekatkan antara kutub selatan magnet A dengan kutub selatan magnet B.
Catatlah apa yang terjadi.

Lakukan berulang-ulang.
Tuliskan hasilnya pada kolom berikut.

Ciri magnet kedua

Percobaan III

Tujuan: setiap magnet yang dipotong akan memiliki dua kutub magnet yang berlainan jenis

Percobaan ketiga

Ambilah magnet batang.
Potonglah magnet tersebut menjadi dua bagian.
Amatilah kedua potongan magnet tersebut.
Jawablah pertanyaan berikut.
berdasarkan pengamatanmu terhadap potongan magnet.

1. Benarkah kutub magnet selalu berpasangan?

2. Benarkah jika magnet dipotong menjadi dua, maka masing-masing potongan tetap memiliki dua kutub?

3. Kesimpulan

Ciri magnet ketiga

Percobaan IV

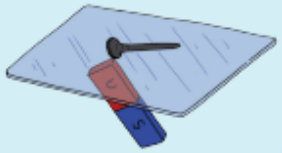
Tujuan: Mengidentifikasi sifat-sifat benda magnetis

Percobaan keempat

Ambilah sebuah magnet dan besi.
Kemudian, dekatkan magnet tersebut ke besi.
Apa yang terjadi?

Ambilah sebuah magnet dan kaca.
Kemudian, dekatkan magnet tersebut ke kaca.
Apa yang terjadi?

Ambilah sebuah magnet, besi, dan kaca.
Kemudian, tarulah besi di bawah kaca dan taruhlah magnet di atas plastik.
Apa yang terjadi?



Kesimpulan

Ciri magnet keempat

Percobaan V

Tujuan: Membuat elektromagnet sederhana

Nama	: .....
Kelas/ No.	: .....

ELEKTROMAGNET SEDERHANA

Tujuan : Membuat magnet dengan cara dialiri arus listrik

Alat dan Bahan : 1.
2.
3.

Langkah kerja : 1.
2.
3.
dst.

Malang, 31 Januari 2017

Mahasiswa Praktikan

Niken Farida Hanum

NIM.13140024

DOCUMENTATION

Class experiment fifth grade A

CURRICULUM VITAE

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E-mail : nikenhanum94@gmail.com

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2007-2010 SMP Negeri Sooko 1 Mojokerto

2011-2014 MA Negeri 1 Kota Mojokerto

2012-2016 S1 Pendidikan Guru Madrasah Ibtidaiyah (PGMI) UIN Maulana Malik Ibrahim Malang

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2014-2015 Member Education Devision Association (HMJ) PGMI

2015-2016 Member Human Resource Deveopment (HRD) AICS Tarbiyah