TABLE OF CONTENT

		Pages
Cove		
Aprov	val Sheet	i
Biography		ii
Abstr	act	iii
Prefac	ce	iv
Table	of Content	vi
List o	f Table	ix
List o	f Figure	X
List o	f Appendix	xi
СНА	PTER I INTRODUCTION	1
1.1	Background	1
1.2	Problem Identification	8
1.3	Problem Limitation	8
1.4	Problem Formulation	8
1.5	Research Objectivies	9
1.6	Reserach Benefits	9
1.7	Operational Definition	10
СНА	PTER II LITERATUR REVIEW	12
2.1	Learning and Physics Learning	12
2.2	Student Worksheet	14
2.2.1	Functions, Objectives, and Uses of Student Worksheet	14
2.2.2	Types of Student Worksheet	15
2.2.3	Characteristic a Good Teaching Materials	16
2.2.4	Term to Make Student Worksheet	17
2.2.5	Applicative Step to Make Student Worksheet	18
2.3	Analysis of Basic Competency of Work and Energy Material	20
2.4	Guided Inquiry Learning Model	21
2 4 1	Definition of Guided Inquiry and Supporting Theory	21

2.4.2	Characteristic of Guided Inquiry	23
2.4.3	Benefit of Guided Inquiry	24
2.4.4	Principle of Guided Inquiry	25
2.4.5	Syntax of Guided Inquiry	25
2.4.6	Advantages and Disadvantages of Guided Inquiry	27
2.5	PhET Simulation	28
2.6	Development Learning Tool	29
2.7	Work and Energy Concept	30
2.8	Relevant Researches	34
2.9	Conceptual Framework	36
CHA	PTER III RESEARCH METH <mark>OD</mark> S	38
3.1	Research Location and Time	38
3.1.1	Research Location	38
3.1.2	Research Time	38
3.2	Research Subjects and Objects	38
3.3	Research Design	38
3.4	Models and Procedures of Development Student Worksheet	38
3.4.1	Models of Development Student Worksheet	38
3.4.2	Procedures of Development Student Worksheet	41
3.5	Data Collection Instruments	45
3.5.1	Front-End Analysis Questionnaire Sheet	46
3.5.2	Student Analysis Questionnaire Sheet	47
3.5.3	Task Analysis Questionnaire Sheet	48
3.5.4	Validation by Material Expert	50
3.5.5	Validation by Media Expert	51
3.5.6	Validation by Physics Teacher	52
3.5.7	The Student Response Questionnaire Instrument Sheet	52
3.6	Data Collection Technique	54
3.7	Data Analysis Technique	55
3.7.1	Data Analysis of the Expert Team Validation Questionnaire	55
3.7.2	Data Analysis of Student Responses	57

CHAPTER IV RESULT AND DISCUSSION OF RESEARCH	
4.1 Result of Research	59
4.1.1 Define Stage	59
4.1.1.1 Front-End Analysis	59
4.1.1.2 Student Analysis	61
4.1.1.3 Task Analysis	62
4.1.1.4 Concept Analysis	64
4.1.2 Design Stage	65
4.1.2.2 Material Selection	65
4.1.2.2 Format Selection	66
4.1.2.3 Preparation of Research Instruments	67
4.1.2.4 Draft 1	68
4.1.3 Develop Stage	69
4.1.3.1 Result of Assessment by Material Experts	69
4.1.3.2 Revision from Material Experts	71
4.1.3.3 Result of Assessment by Media Experts	75
4.1.3.4 Revision by Media Experts	77
4.1.3.5 Response of Physics Teacher	78
4.1.3.6 Result of Small-Group Trial	80
4.1.3.7 Result of Large-Group Trial	81
4.1.3.8 Final Product	82
4.2 Discussion	82
4.3 Limitation of Research	85
100 ·	7.
CHAPTER V CONCLUSION AND SUGGESTION	86
5.1 Conclusion	86
5.2 Suggestion	86
BIBLIOGRAPHY	88
APPENDIX	94

LIST OF TABLE

		Pages
2.1	Core Competencies and Basic Competencies of Physics for	21
	Class X SMA/MA Main Material of Work and Energy	
2.2	Stages of Guided Inquiry Learning Model	26
3.1	Front-End Analysis Questionnaire Sheet	46
3.2	Student Analysis Questionnaire Sheet	47
3.3	Task Analysis Questionnaire Sheet	48
3.4	Student Worksheet Validation Questionnaire Sheet	50
	by Material Expert	
3.5	Student Worksheet Validation Questionnaire Sheet	51
	by Media Expert	
3.6	Teacher Response Questionnaire Instrument	52
3.7	Student Responses Questionnaire Sheet	52
3.8	Criteria for Answer to Validation Instrument Items	56
	with Likert Scale	
3.9	Criteria for Percentage of Student Worksheet Indicators for	56
	Material Expert, Media Expert and Practitioner Expert's	
	Questionnaire	
3.10	Criteria for Answer to Validation Instrument Items	57
	with Gutten Scale	
3.11	Criteria for Percentage of Student Worksheet Indicators for	58
1	Students Response Questionnaire	-
4.1	Results of Analysis of Problems Faced by Teachers	61
4.2	Table of LKPD Feasibility Level Results by Material Experts	69
4.3	Revision Result of Material Experts	71
4.4	Table of LKPD Feasibility Level Results by Media Experts	75
4.5	Revision Result of Media Experts	77
4.6	Table of Physics Teacher's Response to LKPD Results	78
4.7	Student Response Results in Small Group Trials	80
4.8	Student Response Results in Large Group Trials	81

LIST OF FIGURES

		Pages
2.1	Flowchart of Preparation of Student Worksheet	19
2.2	Research and Development Steps	30
2.3	Work by the Force in the Direction of	30
	the Displacement	
2.4	Displacement of Object by Force	31
2.5	The Fallen Coconut is Affacted by The Earth's	33
	Gravitational Force	
3.1	Steps of Modified 3D Development Research	40
	Model Adopted from Thigarajan	
4.1	Chart of Front-End Analysis Results by Students	60
4.2	Chart of Student Analysis Result	62
4.3	Chart of Task Analysis Result	63
4.4	Work and Energy Concept Map	65
4.5	Display of cover LKPD	67
4.6	Content of LKPD	67
4.7	Draft 1	68
4.8	Chart of LKPD Feasibility Level Results by Material Experts	70
4.9	Chart of LKPD Feasibility Level Results by Media Experts	76
4.10	Chart of Physics Teacher's Response to LKPD Results	79
4.11	Chart of Student Response Results in Small Group Trials	80
4.12	Chart of Student Response Results in Large Group Trials	81
100	1 11 1 11 11 11	1

LIST OF APPENDIX

		Pages
Appendix-1	Angket Analisisis Awal-Akhir Oleh Peserta Didik	94
Appendix-2	Instrumen Wawancara Guru	96
Appendix-3	Angket Analisis Peserta Didik	98
Appendix-4	Angket Analisis Tugas Peserta Didik	99
Appendix-5	Angket Penilaian Pengembangan Lembar Kegiatan	101
	Peserta Didik (LKPD) Berbasis Inkuiri Terbimbing	
	Pada Materi Usaha Dan Energi Di Kelas X MIA	
) Wi	SMAN 10 Medan T.P 2020/2021 Oleh Ahli Materi	- (
Appendix-6	Rubrik Validasi Oleh Ahli Materi	103
Appendix-7	Angket Penilaian Pengembangan Lembar Kegiatan	107
	Peserta Didik (LKPD) Berbasis Inkuiri Terbimbing	
	Pada Materi Usaha Dan Energi Di Kelas X MIA	
	SMAN 10 Medan T.P 2020/2021 Oleh Ahli Media	
Appendix-8	Rubrik Validasi Oleh Ahli Media	109
Appendix-9	Angket Respon Pengembangan Lembar Kegiatan	112
	Peserta Didik (LKPD) Berbasis Inkuiri Terbimbing	
	Pada Materi Usaha Dan Energi Di Kelas X MIA	
	SMAN 10 Medan T.P 2020/2021 Oleh Guru Fisika	
Appendix-10	Rubrik Penilaian Oleh Guru Fisika	115
Appendix-11	Angket Respon Peserta Didik Terhadap LKPD	119
10	Berbasis Inkuiri Terbimbing Berbantu PhET	
1/2/1	Simulation Pada Materi Usaha Dan Energi	E.
Appendix-12	Results of Front-End Analysis Questionnaire Students	122
Appendix-13	Table of Front-End Analysis Questionnaire by Students	125
Appendix-14	Result of Teacher Interview	127
Appendix-15	Results of Student Analysis Questionnaire	130
Appendix-16	Table of Student Analysis Questionnaire Result	132
Appendix-17	Results of Task Analysis Questionnaire	133
Appendix-18	Table of Task Analysis Questionnaire Result	136

Appendix-19	Analysis of Validation Result by Material Experts	138
Appendix-20	Validation Result Material Experts Sheet	140
Appendix-21	Analysis of Validation Result by Media Experts	144
Appendix-22	Validation Result by Media Experts Sheet	146
Appendix-23	Analysis of Teacher Response to LKPD	150
Appendix-24	Teacher Response to LKPD Sheet	152
Appendix-25	Tabulation of Student Responses to LKPD	154
	In Small Group Trials	
Appendix-26	Tabulation of Student Responses to LKPD	158
1111	In Large Group Trials	7
Appendix-27	Table of Student Responses to LKPD In	161
	Large Group Trials	
Appendix-28	Documentation	163
Appendix-29	Permit to Conduct Research from FMIPA	165
Appendix-30	Permit to Conduct Research from the	166
	Education Office of North Sumatra Province	
Appendix-31	Certificate has been Conducted research of	167
	SMAN 10 Medan	
Appendix-32	LKPD Product	168

