

TABLE OF CONTENT

APPROVAL FORM OF RESEARCH PAPER	
DECLARATION	i
PREFACE	ii
ACKNOWLEDGE	iii
ABSTRACT	v
ABSTRAK	vi
TABLE OF CONTENT	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDIX	xi
CHAPTER I : BACKGROUND	
A. Background	1
B. Research Problems	4
C. Purposes	5
D. Significance of Research	5
E. Assumption	6
F. Hypothesis	6
CHAPTER II : LITERATURE REVIEW	
A. Learning Process	7
B. Instructional Media	8
1. Definition of Media	8
2. Advantages of Learning Media	10
3. Charateristics of Instructional Media	10
C. Simulation	11
1. Definition of Simulation	11
2. Benefit of Simulation	12
3. PhET Simulation	13
D. PowerPoint Presentation	16
E. Learning Achievement	17
F. Light Refraction Concept	19

G. Relevant Research	27
CHAPTER III : RESEARCH METHODOLOGY	
A. Research Design	28
B. Research Subject	29
C. Definition of Terms	29
D. Instructional Tools	30
E. Treatment	31
1. PhET Simulation	31
2. PowerPoint Presentation	33
F. Research Instrument	35
1. Learning Achievement Test (Pretest and Posttest)	35
2. Questionnaire	40
G. Research Procedures	42
H. Data Analyzing	46
1. Analysis Improvement of Students' Achievement	46
2. Analysis Improvement of Students' Achievement in Cognitive Domain	47
3. Analysis of Questionnaire	49
CHAPTER IV : RESULTS AND DISCUSSIONS	
A. Results	50
B. Discussions	65
CHAPTER V : CONCLUSIONS AND RECOMMENDATIONS	
A. Conclusions	69
B. Recommendations	70
REFERENCES	68
APPENDICES	