

TABLE OF CONTENTS

SHEET OF LEGITIMATION	i
DECLARATION	ii
ABSTRACT	iii
PREFACE	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENT	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDIX	xii
CHAPTER I INTRODUCTION	
A. Background	1
B. Research Problem	5
C. Research Question	5
D. Limitation Of Problem	5
E. Research Objective	6
F. Research Benefit	6
CHAPTER II LITERATURE REVIEW	
A. Problem Based Learning with Multiple Representations Approach.....	7
B. Scientific Consistency	16
C. Heat Concept.....	18
D. Relevant Research.....	25
CHAPTER III METHODOLOGY	
A. Research Method and Research Design	27
B. Location and Sample	27

C. Assumption	28
D. Hypothesis.....	28
E. Operational Definition	29
F. Research Instrument	30
G. Instrument Validation Result	34
H. Data Analysis	35
I. Research Procedure	36
CHAPTER IV FINDINGS AND DISCUSSIONS	
A. Results and Discussion of Problem Based Learning Model of Multiple Representations Approach.....	39
B. The Result and Discussion of Scientific Consistency.....	52
CHAPTER V CONCLUSION AND RECOMMENDATION	
A. Conclusion	64
B. Recommendation	64
REFERENCES	66
APPENDIX	
A. INSTRUCTIONAL TOOLS	69
B. RESEARCH INSTRUMENT	92
C. DATA RESULT	152
D. DOCUMENTATION.....	164
AUTOBIOGRAPHY	165

LIST OF TABLES

Table 2.1 Syntax of Problem Based Learning Model	8
Table 2.2 application the multiple representation approach on Problem Based Learning model	13
Table 2.3 Assessment of Scientific Consistency	16
Table 2.4 Core and Basic Competence of Heat Transfer	18
Table 2.5 Conductivity.....	21
Table 3.1 One-group post-test pre-test Design	27
Table 3.2 Interpretation of Validity	31
Table 3.3 Interpretation of Reliability	32
Table 3.4 Interpretation of Difficulty Level	33
Table 3.5 Interpretation of Discriminating Power	34
Table 3.6 Criteria of Normalized Gain	35
Table 4.1 Percentage of Learning Model Implementation.....	39
Table 4.2 Students' Scientific Consistency on Pre Test and Post Test.....	52
Table 4.3 Scientific Consistency N-Gain on Every Sub Concept.....	55
Table 4.4 Amount of student has enhancement on Scientific Consistency.....	58

LIST OF FIGURES

Figure 2.1 Styrofoam is low conductivity	22
Figure 2.2 Sea breeze Land breeze	24
Figure 2.3 Radiant energy	25
Figure 2.4 Radiant energy type	23
Figure 3.1 Research Procedure	38
Figure 4.1 Orientation Syntax	40
Figure 4.2 Organize Syntax.....	41
Figure 4.3 Teachers' demonstration.....	42
Figure 4.4 conductor isolator demonstration.....	42
Figure 4.5 Students' Investigation.....	43
Figure 4.6 Communicating syntax.....	43
Figure 4.7 Motivating students	45
Figure 4.8 Giving problems	45
Figure 4.9 convection investigation	46
Figure 4.10 Students full fill the worksheet	47
Figure 4.11 Investigation second problem	47
Figure 4.12 Communicate	48
Figure 4.13 Identify the phenomena of heat transfer	48
Figure 4.14 Making poster	51
Figure 4.15 sea breeze land breeze communication.....	51
Figure 4.16 Average of Enhancement of Scientific Consistency on Heat Transfer Concept	53
Figure 4.17 Enhancement of Scientific Consistency on Every Sub Concept.....	56
Figure 4.18 Amount of student has Scientific Consistency enhancement on conduction	59

Figure 4.19 Amount of student has Scientific Consistency enhancement on convection.....	59
Figure4.20 Amount of student has Scientific Consistency enhancement on radiation.....	60
Figure 4.21 Amount of student has Scientific Consistency enhancement on sea breeze.....	61
Figure 4.22Amount of student has Scientific Consistency enhancement on sea land.....	62

LIST OF APPENDICES

	Page
A. INSTRUCTIONAL TOOLS	
Appendix A.1 Lesson Plan (First Meeting).....	72
Appendix A.2 Lesson Plan (Second Meeting).....	78
Appendix A.3 Lesson Plan (Third Meeting).....	84
Appendix A.4 Question and Answer Worksheet.....	87
B. RESEARCH INSTRUMENT	
Appendix B.1 Instrument of Multiple Representations Question.....	92
Appendix B.2 Instrument of Multiple Representations Test Pre Test-Post Test.....	126
Appendix B.3 Forms of Expert Judgement.....	149
Appendix B.4 Observation Sheet.....	150
C. RESULT OF RESEARCH DATA	
Appendix C.1 Data Processing of Scientific Consistency.....	152
Appendix C.2 Data Processing of Students' Scientific Consistency On Every Sub Concept.....	158
Appendix C.3 Data Processing of The Number Of Students' Scientific Consistency On Every Sub Theme.....	163
D. DOCUMENTATION	
Appendix D.1 Photo Documentation.....	164