

# Types of Explanations of Physical Phenomena among the Tenth Grade Students

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Received May 27, 2014; Revised February 03, 2015; Accepted February 10, 2015

**Abstract** This research aims to identify the interpretations percentages, correct, missing, and erroneous to some physical phenomena among the tenth grade students, and detect the presence of significant differences between the mean scores of some the physical phenomena interpretations of the students due to the variable of grade (9<sup>th</sup> /10<sup>th</sup>), and detecting the presence of significant differences between the mean scores of some the physical phenomena interpretations among the tenth grade students due to the gender variable. The researcher followed the descriptive approach, and designed a test of multiple choice (25) questions, and chose an intentional sample of tenth grade students in public schools in the middle of the provinces of Gaza amounted to (216) male and female students from the ninth and tenth grades key the researcher used the frequencies and percentages, t-test for two independent samples for statistical treatments. And he reached several results, including: that the percentage of correct interpretations of the physical phenomena among the tenth grade students was (42.63 %), the highest percentages of correct interpretations were concerned with phenomena of: simple harmonic motion, applications of Archimedes, atmospheric pressure, volumetric expansion of liquids, non-renewable energy, applications of Bernoulli's principle, Longitudinal expansion of solids (69.3, 67.5, 61.4, 57.9, 53.5, 53.5, 53.5), respectively. The percentage of missing interpretations for some physical phenomena at the tenth grade students was (25.86 %), and the highest percentages were concerned with explanations phenomena: the sea breeze, Conductivity in solids, solar collector, Flotation, fluid, thermal Earth's energy, latent heat of fusion (52.3, 52.3, 0.50, 43.9, 35.1, 32.5, 30.7), respectively, and the proportion of mistaken interpretations is for some physical phenomena at the tenth grade students was (31.51 %), and the highest percentages of interpretations were related to the phenomena: biomass energy, thermostat, liquid pressure, thermal capacity, Solar collectors, thermal equilibrium, the sea breeze (63.2, 62.3, 58.8, 43.9 0.36, 36, 34.2), respectively. The study disclosed the superiority of tenth grade students in some of the explanations of physical phenomena on the ninth grade.

**Keywords:** *scientific explanation, the incomplete explanation, wrong interpretation, physical phenomena, the tenth grade*

**Cite This Article:** Yahya M. Abu Jahjouh, "Types of Explanations of Physical Phenomena among the Tenth Grade Students." *American Journal of Educational Research*, vol. 3, no. 2 (2015): 191-196. doi: 10.12691/education-3-2-12.

## 1. Introduction

The human thinker organism, influenced by the surrounding environment and affects and interacts with the Universal and natural phenomena, so that the reaction is positive, the necessary human understanding of these phenomena and how they occur, it is not enough to describe, but it is necessary to be able to perception the reasons for their occurrence and interpreted scientifically comprehensive and integrated.

The science aims of beyond just phenomena observation and describing them, but rather seeks to know the reasons for the occurrence of these phenomena and how they occur and the factors affecting them and to achieve understanding and interpretation, it requires access to scientific theories useful in explaining the phenomena of a more comprehensive, to take advantage

of them and technology applied on scientific bases, to predict their occurrence in the future and try to make organized efforts to control its negative effects.

It should be available in the content of a textbook of science attitudes and educational experiences may include relationships and interactions that would put the learner in situations calling for the thinking and practice of science and the process as an explanation of some natural phenomena surface tension, buoyancy, electricity, density, temperature, energy and conductivity.

Regardless of the diversity of the vision of interpretation, as an important goal from the goals of science in general, and as a process of science processes Integrative, and as the level of domain levels of mental to the teaching of science, the explanation as a goal and as a process and as the level is very necessary Educational Scientific and in the teaching of science in thinking about scientific phenomena and to explore the reasons for their

occurrence correct and how they occur and linked to each other and to understand the scientific principles upon which the scientific laws that govern them.

And focused on the International Scientific Symposium, which was held at Cornell University in 1983 analyzed the scientific concepts and their interpretations, and pointed to the seriousness of the acquisition of all students in grades explanations for incomplete or inaccurate or wrong about a lot of natural phenomena.

The many previous studies on scientific explanations, as a study Ziton (1998), which sought to reveal the perceptions of scientific alternative prep school pupils about fourteen concept: mass, chemical reaction, and the clouds, and the blue of the sky, and the rotation of the electron, lightning, heat and temperature, and rainbow, eyesight, refraction of light, and the mirage, and the wave motion, the colors of the spectrum, Anthem, and applied the test of multiple choice on an intentional sample amounted to one hundred pupils from third-graders intermediate, and revealed the existence of more alternative conceptions in the field of the concepts of physics by (56.5 %), in the field of chemistry by (28.3 %), in the field of biology and earth science by (7 %) have been observed alternative conceptions about the whole concept of the phenomenon and its causes.

The study Mtaua (1998), which aimed to diagnose beliefs and interpretations superstitious among students teachers Division of primary education about some of the natural phenomena and treatment, and reached twice the level of the students at their interpretation of the phenomena of science, to the absence of effects are statistically significant to the genus students' beliefs and interpretations superstitious phenomena of science.

The study Alwoseme (2000), which aimed to reveal the effectiveness of the content of the science curriculum at secondary schools in Saudi Arabia in the students' understanding of science, society, and technology issues, and the development of attitudes towards science and technology has not reached to the presence of statistically significant differences between the average score for first-grade students of secondary and intermediate degrees of third-grade students of secondary for them and reached a low level of students' understanding of most of these issues and scientific phenomena.

The study Farraj (2000), which aimed to identify the extent to which the content of the science curriculum middle school in Saudi Arabia to the dimensions of science and operations and the understanding of the students have, and reached a low level of students in grades first and third the average skill of interpretation and the superiority of third-graders on the first-grade students.

The study Shaheen (2005), which aimed to reveal the perceptions of science teachers at the primary level for some of the concepts of basic chemicals and the relationships between them, and these concepts are: the material, component, and the molecule, and corn, and the boat, and the solution, and the mixture reached perceptions incomplete and unscientific and recommended that urged students to formation of explanations for everyday phenomena.

The study Alaayash (2009), which aimed to investigate the extent of understanding of science teachers for basic education to some aspects of the nature of science and the results showed that the understanding of teachers to some

aspects of the nature of science was a combination between understandings structural and traditional which is closer to the traditional understanding of where considered science experimental basis and therefore the acquaintance controlled and steady half of them have realized the difference between observation and inference and failed to differentiate between laws and scientific theories.

The study Hossam El Din (2010), which reached to the presence of a number of alternative conceptions of the concepts of the subject of electrical and concepts: Column simple, and electricity, and the generator voltage, the voltage difference, and the intensity of the current, and electrical resistance, and electromotive force, and Ohm's law and the existence of a positive correlation between absorb the concepts of electrical and scientific reasoning among the pupils of the third preparatory.

The study Qadri and Mona and Kaplan (2010), which aimed to uncover perceptions epistemological to learn scientific concepts to the parameters of the first three rows and their relationship to the level of their experience of teaching and the results showed that the prevalence of a number of perceptions epistemological error and the existence of significant differences attributable to the level of teaching experience for the benefit of women with long experience.

The study Buffler, Lubben, & Ibrahim (2009), which aimed to detect the relationship between the views of students about the nature of science and views about the nature of scientific measurement, was the use of two tests of the type of multiple-choice, have been classified view of the nature of science into four categories: real values, and scientific laws, and scientific theories, observations and experimentation. The results that students with beliefs that the nature of science focused on the laws of nature more strongly the importance of scientific measurement, while students with beliefs that scientific theories are the ideas of scientists have beliefs that the nature of scientific measurements is uncertain, than students with beliefs that the nature of science is based on observations and experimentation.

## 2. The Determination of Research Problem

The research problem is determined in the following main question:

What Types of explanations of physical phenomena a among the tenth grade students in Palestine?

Which is divided into the following questions:

1 - What is the correct of explanations percentages for some of the physical phenomena at the tenth grade students in Palestine ?

2 - What is the missing explanations percentages for some of the physical phenomena at the tenth grade students in Palestine?

3 - what is the mistakes interpretations percentages of some physical phenomena at the tenth grade students in Palestine ?

4 - Is there a significant difference between the scores means of interpretations of some of physical phenomena among students due to the variable grade (9<sup>th</sup>/10<sup>th</sup>)?

**Research hypotheses:** There is no significant difference ( $\alpha \leq 0.05$ ) between the scores means of

interpretations of some of physical phenomena among students due to the variable grade (9<sup>th</sup>/10<sup>th</sup>).

### The importance of research:

The importance of this research are as follows:

1 -The nature of subject, which focuses on students' explanations of physical phenomena.

2 - are expected to benefit from this research, officials at the center of the Palestinian curriculum in the development of the science curriculum for tenth grade students so that adapts to the needs of the students and take into account their understanding of integrated explain how scientific phenomena.

3 - may benefit from the results of this research and recommendations of educational supervisors in directing science teachers to teach scientific phenomena with appropriate methods.

### Research objectives:

The research aims to identify the percentages of interpretations correct and missing and error to some physical phenomena at the tenth grade students in Palestine, detecting the presence of significant differences between the scores means of interpretations of some of the physical phenomena among the students due to the variable grade (9<sup>th</sup> /10<sup>th</sup>), and detecting the presence of significant differences between the scores means of interpretations of some of the physical phenomena at the tenth grade students due to the variable gender.

### Research limitation:

The researcher confined to at the conduct of this research on the following:

1 - selected sample of students in grades ninth and tenth basic primary -secondary schools in Gaza City.

2 - The application of this research in the field at the end of the academic year (2012/2013).

3 - a group of natural phenomena in the field of physics within the content of the science textbook for the tenth grade.

### Research Terms:

The correct interpretation: the scientific explanation, which depends on the student connect their real causes physical phenomenon based on scientific bases. The incomplete explanation: the interpretation depends on the student link the physical phenomenon of the one causes of shrugging off the rest of the reasons responsible for the occurrence. The interpretation mistake: the interpretation depends on the student returns the occurrence of the phenomenon of physical things that are not real causes or merely described. Physical phenomena: the events linked to nature occur frequently and regularly, and is due to occur to cause or several real reasons, has been represented in the current research in the 25 phenomenon were distributed to the domains: solar energy, acidic rains, biomass energy, the thermo Earth's energy, and the pressure of fluid static and dynamic, The buoyancy of masses, the heat, the sea breeze, thermal conductivity, and the elongation, and the thermal equilibrium.

### Research procedures:

#### 1. Research Methodology:

The researcher follow descriptive approach, which focuses on the study of the phenomenon is also present in the real, without the intervention of a researcher at the variables controlled, and this is what fits in the measurement of the current research in interpretations of

some scientific phenomena among the students of tenth grade.

#### 2. the research sample:

The sample consisted of 108 male and 108 female students from the ninth and tenth grades principal during the second semester of the academic year 2012/2013, which were distributed as follows in [Table 1](#).

**Table 1. Distribution of research sample according research variables**

Variable	categories	No.	Summation
Gender	M.	108	216
	F.	108	
Class	9 <sup>th</sup>	102	216
	10 <sup>th</sup>	114	

#### 3. Research instrument:

The research tool was formed in the current research of interpretations physical phenomena test:

The researcher developed a interpretations test of the physical phenomena by following these steps:

1 - Determine the goal of the test: The test is aimed to measure of explanations for physical phenomena at the tenth grade students.

2 - determine the dimensions of the scientific explanations of phenomena: the dimensions were identified explanations for scientific phenomena access to the previous studies and science textbook for the tenth grade primary.

3 - the formulation of test questions: was the use of multiple choice questions to measure the suitability of the explanations for physical phenomena.

4 - The test design: The test was contested of 25 questions, which were formulated one question for each phenomenon: fossil fuel, acidic rain, solar energy, solar collector, biomass energy, the thermo Earth's energy intake, Freefall, simple harmonic motion, fluid, pressure liquid, air pressure, Pascal applications, Archimedes applications, materials buoyant, applications of Bernoulli's principle, heat capacity, specific heat, the sea breeze, the heat transfer in solids, heat conduction in the water, balancing heat, latent heat of fusion, elongation expansion of metals, expansion volumetric fluid, and control of the temperature of electrical appliances.

5 - Test guidance: the instructions were written at the beginning of the test questions, such as: student data, gender, school, the achievement average, level, and illustrate how to answer questions.

6 - Validity and Reliability of the test: To ensure the Validity of the test were presented to a group of arbitrators specialists in the methods of teaching science, and some physics teachers; to express their views in: scientific accuracy, language of the questions, comprehensiveness, and their relevance and validity of the test for the application. To investigate the reliability, the split half method was used retail (0.76), indicating that the test has consistently appropriate.

7 - Grading and method of correction: was developed two degrees of scientific correct interpretation, one degree of the ellipse interpretation, and (0) for the mistake interpretation of the, and thus was the maximum score for the test (50) degrees, the student gets it if he chooses all the answers concerning interpretations of correct scientific phenomena physical, The minimum degree (0) if chooses all the answers concerning mistake interpretations.

**Fifthly - research steps:** To answer research questions, and test the validity of hypothesis ; the researcher doing the following:

1 - Review of educational literature on science skills and explanations of scientific phenomena.

2 - found on previous studies, Summarization, and then comment on it.

3 - select a list of scientific phenomena in the field of physic, and displayed on a group of professional arbitrators.

4 - build a research tool, and make sure validity and reliability.

5 - collect data from the research sample of students in ninth and tenth grades, and discharged using a computerized program (SPSS).

6 - Analysis of the data to arrive at the results, displayed in tables, interpreted, then formulate of recommendations.

**VI - Statistical Methods:** The researcher used frequencies, percentages and t-test for two independent samples.

**Research Results:** First - the answer to the first question of the research questions, which states: What is the correct of explanations percentages for some of the physical phenomena at the tenth grade students in Palestine? To answer this question; the researcher was counting, frequencies and percentages for grades students in the tenth in test of explanations of physical phenomena, as shown in [Table 2](#):

**Table 2. percentages of correct interpretations of some of the physical phenomena at the tenth grade students**

series	Phenomena	frequencies	%	Rank
1	Non-renewable energy	61	53.5	5
2	Acidic rain	59	51.8	8
3	Solar Energy	43	37.7	16
4	Solar Collector	16	14	24
5	Biomass Energy	29	25.4	22
6	Geothermal Energy	51	44.7	13
7	The free fall	56	49.1	11
8	Simple Harmonic Motion	79	69.3	1
9	Fluid	49	43	15
10	Liquid pressure	34	29.8	19
11	Atmospheric pressure	70	61.4	3
12	Applications of Pascal's principle	56	49.1	12
13	Applications of Archimedes	77	67.5	2
14	The Float	32	28.1	21
15	Applications of Bernoulli's Principle	61	53.5	5
16	Heat Capacity	34	29.8	20
17	Specific heat	50	43.9	14
18	Sea breeze	15	13.2	25
19	Conduction in Solid	18	15.8	23
20	Convection in Liquids	57	50	9
21	The thermal equilibrium	57	50	9
22	Latent heat of fusion	41	36	18
23	The Longitudinal stretch of solids	61	53.5	5
24	Volumetric expansion of liquids	66	57.9	4
25	Thermostat	43	37.7	17
	<b>Total</b>	<b>1215</b>	<b>42.63%</b>	

Shown in [Table 2](#) that the percentages of correct interpretations of the physical phenomena at the tenth

grade students was (42.63%), and the highest rates of correct interpretations of whether phenomena: simple harmonic motion, applications of Archimedes, atmospheric pressure, volumetric expansion of liquids, non-renewable energy, applications of Bernoulli's principle, and The Longitudinal stretch of solids (69.3, 67.5, 61.4, 57.9, 53.5, 53.5, 53.5), respectively.

This may be due to the ability of students in the tenth grade to provide logical explanations for these phenomena, and evaluated based on scientific bases, to students encourage and directing them to the survey on the causes of these phenomena more than other phenomena, through planned science lessons, and included directed scientific activities, provide for students learning environment rich excitors that stimulate their abilities, the evolution of their different skills in the search for causes, and explain phenomena scientific explanation, in addition to the diversification of the tasks presented to them, the use of science teachers for teaching strategies appropriate, in addition to the science textbook for the tenth grade basic contains extensive information related to those phenomena specifically more than others, in addition to the nature of these phenomena familiarity in the lives of students and feel its applications such as springs, floatable of objects, movement of vessels in the waters of the Mediterranean on the shores of the Gaza Strip, and the use of sprays fragrance as an application of the principle of Bernoulli.

Second - the answer to the second question of the research questions, which states: What is the incomplete of percentages for some of the physical phenomena at the tenth grade students in Palestine? To answer this question; the researcher was counting, frequencies and percentages for grades students in the tenth in test of explanations of physical phenomena, as shown in [Table 3](#):

**Table 3. percentages of incomplete interpretations of some of the physical phenomena at the tenth grade students**

Series	Phenomena	frequencies	%	Rank
1	Non-renewable energy	24	21.1	16
2	Acidic rain	18	15.8	18
3	Solar Energy	33	28.9	9
4	Solar Collector	57	50	3
5	Biomass Energy	13	11.4	23
6	Geothermal Energy	37	32.5	6
7	<i>The free fall</i>	28	24.6	14
8	Simple Harmonic Motion	16	14	20
9	Fluid	40	35.1	5
10	<i>Liquid pressure</i>	13	11.4	24
11	Atmospheric pressure	20	17.5	17
12	Applications of Pascal's principle	25	21.9	15
13	Applications of Archimedes	16	14	21
14	The Float	50	43.9	4
15	Applications of Bernoulli's Principle	34	29.8	8
16	Heat Capacity	30	26.3	12
17	Specific heat	30	26.3	13
18	Sea breeze	60	52.3	1
19	<i>Conduction in Solid</i>	60	52.3	1
20	<i>Convection in Liquids</i>	31	27.2	11
21	The thermal equilibrium	16	14	22
22	Latent heat of fusion	35	30.7	7
23	The Longitudinal stretch of solids	18	15.8	19
24	Volumetric expansion of liquids	33	28.9	10
25	Thermostat	0	0	25
	<b>Total</b>	<b>737</b>	<b>25.86%</b>	

Shown in Table 3 that the percentages of incomplete interpretations for some physical phenomena at the tenth grade students was (25.86%), and the highest rates of incomplete explanations were phenomena: the sea breeze, *Conduction in Solid*, solar collector, the float, fluid, Geothermal Energy, and the latent heat of fusion (52.3, 52.3, 50, 43.9, 35.1, 32.5, 30.7), respectively.

This may be due to the fact that the phenomena of nature is simple, and they occur constantly in an environment of students; so only students interpret unilaterally without going into detail or thinking about the reasons they occur multiple, in addition to the belief of science teachers that students can interpret these phenomena easily, and provide expertise the former, so keen on the shortcut in the time to teach and carry out its activities, and for the sake of study subjects believe they need greater attention due to their difficulty or importance. In addition to the weakness in the presentation of the content of the book Science for example, was addressed to the phenomenon of the sea breeze in the science book for the tenth grade primary through part of the example of the specific heat. Was addressed to solar water heaters through practical activity focuses on the comparison between the status of a balloon black and white balloon in the sun and the comparison between the status of an open egg and egg covered with a piece of glass in the sun.

Third - the answer to the third question of the research questions, which states: What is the errors of percentages for some of the physical phenomena at the tenth grade students in Palestine? To answer this question; the researcher was counting, frequencies and percentages for grades students in the tenth in test of explanations of physical phenomena, as shown in Table 4:

**Table 4. percentages of errors interpretations of some of the physical phenomena at the tenth grade students**

Series	Phenomena	frequencies	%	Rank
1	Non-renewable energy	29	25.4	17
2	Acidic rain	37	32.5	10
3	Solar Energy	38	33.3	8
4	Solar Collector	41	36	5
5	Biomass Energy	72	63.2	1
6	Geothermal Energy	26	22.8	18
7	<i>The free fall</i>	30	26.3	16
8	Simple Harmonic Motion	19	16.7	23
9	Fluid	25	21.9	20
10	<i>Liquid pressure</i>	67	58.8	3
11	Atmospheric pressure	24	21.1	21
12	Applications of Pascal's principle	33	28.9	14
13	Applications of Archimedes	21	18.4	22
14	The Float	32	28.1	15
15	Applications of Bernoulli's Principle	19	16.7	23
16	Heat Capacity	50	43.9	4
17	Specific heat	34	29.8	13
18	Sea breeze	39	34.2	7
19	<i>Conduction in Solid</i>	36	31.6	11
20	<i>Convection in Liquids</i>	26	22.8	18
21	The thermal equilibrium	41	36	5
22	Latent heat of fusion	38	33.3	8
23	The Longitudinal stretch of solids	35	30.7	12
24	Volumetric expansion of liquids	15	13.2	25
25	Thermostat	71	62.3	2
	<b>Total</b>	898	31.51%	

Shown in Table 4 that the percentages of interpretations is wrong for some physical phenomena at the tenth grade students was (31.51%), and the highest rates of interpretations of error was phenomena: biomass energy, thermostat, liquid pressure, heat capacity, Solar Collector, The thermal equilibrium, Sea Breeze (63.2, 62.3, 58.8, 43.9 0.36, 36, 34.2), respectively.

This may be due to several factors: foreign -related Platform science and learning environment, it handled the science curriculum for the tenth grade for these phenomena is not suitable and did not include knowledge of appropriate scientific and dealt with logically and routine non- call requirements earlier, and the omission of examples enough to be clarified, and the method of presentation is suitable not contain graphics, forms and maps concepts help students contemplation and learning, as well as the level of readability of texts drafting scientific and not educational, as well as methods of teaching those subjects based on verbal and non-employment of methods of teaching practical and active learning strategies, and internal factors related to the student such as poor motivation to learn the causes of these phenomena despite their importance, the weakness of his interests, and the lack of previous experience he has.

For example, interpreted by most students reason consists biomass energy breeding organisms of animal, and the omission of objects and plant residues and animal waste from the components of bio-energy in spite of the detail in the bio-fuels, and that the occurrence of the students in the alternative scenario for the true concept because of confusion and overlap between the concept of bio-energy and the organism. And deficiencies in the interpretation of the cause of the curvature of the tape in binary metallic thermostat. And the weakness of previous experiences with the students for a property for Soil runoff and confused with the density of fluid in their effect on the fluid pressure.

Fourth - Validate first hypothesis of the research, which states: No significant difference ( $\alpha \leq 0.05$ ) between the scores means of interpretations of some of the physical phenomena of the students due to the variable grade (9<sup>th</sup> / 10<sup>th</sup>); according to researcher t-test for two independent samples, as shown in Table 5:

**Table 5. Results of the "T" test to examine the difference between the means scores of students in the 9<sup>th</sup> and 10<sup>th</sup> classes in the interpretation of physics phenomena**

Class	No.	Mean	S.D.	d.f.	T value
9 <sup>th</sup>	102	23.2	4.27	214	5.56**
10 <sup>th</sup>	114	27.8	7.29		

\* (t) Tabulated Value at degrees of freedom (214) and the level of significance (0.05) is (1.97).

\*\* (t) Tabulated Value at degrees of freedom (214) and the level of significance (0.01) is (2.6).

Shown in Table 5 that the calculated "T" value is greater than the value of tabulated "t" at the level of significance (0.01), and this indicates a statistically significant difference between the means scores of students in the 10<sup>th</sup> class and students in the 9<sup>th</sup>, and in favor of the 10<sup>th</sup> class students in the scientific interpretation of physics phenomena.

The attributed this result to provide the scientific knowledge of facts, concepts and generalizations, laws and theories related to most of these physical phenomena in the science curriculum for tenth grade primary much

more availability in the science curriculum for ninth grade platform, in addition to the transmission of tenth grade students to secondary school and study with students older, and increase the capacity of the mental, scientific and learning them, which generates have the ability to think scientifically and to ensure that the acquisition of scientific knowledge and understanding and interpretation, compared to students of ninth grade who are still studying in the schools of the upper basic stage and with the younger students.

### 3. Recommendations of the Research

In light of the findings of the current research; the researcher recommends the following recommendations:

- Paying attention to the officials at the center of the curriculum to contain the science curriculum on the full explanations of scientific phenomena that are included in a book of science, especially the phenomena: the sea breeze, plug in solids, solar heating, buoyancy, fluid, thermal energy the Earth, and the latent heat of fusion.

- Striving to address the interpretations error phenomena: bioenergy, thermostat, fluid pressure, heat capacity, solar heaters, equilibrium warming, the sea breeze, through the examination of the reasons for their formation and use of means of sensory and real life examples and variety that explain the reasons for their occurrence and linked to scientific knowledge correct and constructs students mental.

- Directing the supervisors for science teachers employ active learning strategies in the teaching of science, from the classroom first, and careful scientific explanations for various phenomena, and the emphasis on call all previous experience required for new scientific knowledge.

- Concentration science teachers to explain the physical phenomena at the tenth grade students, especially male students of them.

### 4. Conclusions

- Has a tenth grade students a range of scientific explanations of physical phenomena, such as: simple harmonic motion, applications of Archimedes, atmospheric pressure, volumetric expansion of liquids, non-renewable energy, applications of Bernoulli's principle, and the linear expansion of solids.

- Contain the science book for the tenth grade on a set of basic scientific knowledge of the organization and

practical activities that help in the acquisition of some of the students' science as a process of interpretation.

- Has a tenth grade students a range of explanations for the missing physical phenomena, such as the sea breeze, plug in solids, solar heating, buoyancy, fluid, thermal energy the Earth, and the latent heat of fusion.

- The weakness of the view in the science book for the tenth grade to some basic aspects of scientific knowledge associated with certain physical phenomena.

- Has a tenth grade students a range of interpretations of error of physical phenomena, such as bio-energy, thermostat, fluid pressure, heat capacity, solar heaters, heat balance, the sea breeze.

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