Exploring Primary Student's Misconceptions on Matter and Heat in Malaysian Schools

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ABSTRACT

This study employed an exploratory quantitative descriptive design to identify the level of misconception among Malaysian primary school students on science topics, specifically related to matter and heat. A total of 289 students participated in the study, comprising 136 Year 3 students from the state of Perak and 153 Year 5 students from the state of Selangor. Two sets of open-ended test instruments were developed based on the national science syllabus and validated by expert science educators. Each set consisted of six subjective questions designed to elicit students' understanding of the targeted topics. The data collected were descriptively analysed to determine the patterns of misconception. Findings revealed that Year 3 students demonstrated a high level of misconception in both matter and heat, while Year 5 students exhibited a high level of misconception in matter but a relatively lower level in heat. Most students experienced difficulties in describing the properties of matter and explaining its transformation processes. In addition, many students struggled to define and conceptualize heat scientifically, often confusing it with temperature and relying on everyday experiences or non-scientific terms. These results highlight the prevalence of misconceptions in early science learning and the importance of addressing them through more conceptually grounded instruction.

Keywords: primary school science, misconception, matter, heat

INTRODUCTION

Malaysia must remain competitive in the fields of science and technology to achieve its vision of becoming a developed country. In alignment with this goal, science education has been consistently emphasized by the Ministry of Education Malaysia (MoE). One of the key indicators of student performance in science is the Trends in International Mathematics and Science Study (TIMSS), an international standardized test held every four years to assess students' mastery of mathematics and science concepts worldwide. Malaysia's TIMSS performance has raised concern in recent years. For instance, Malaysian students scored 471 in TIMSS 2015 and 466 in TIMSS 2019, both scores below the international average of 500, reflecting persistent gaps in higher-order thinking skills such as reasoning, applying, and analyzing (Mullis et al., 2020; Ministry of Education Malaysia, 2020). These shortcomings highlight the need for targeted initiatives to strengthen students' scientific understanding and critical thinking.

According to Shtulman and Legare (2019), reasoning, application, and analytical skills are difficult to acquire when students hold misconceptions in early science topics. Misconceptions do not always align with formal scientific knowledge, as they often stem from students' everyday experiences, personal interpretations, or the inability to articulate ideas using correct scientific language. A recent study by Sari et al. (2021) revealed that students frequently apply intuitive thinking and incomplete reasoning in explaining scientific phenomena, which contributes to the formation of misconceptions. Students often fail to understand foundational science concepts due to inconsistencies between what they are expected to know and what is actually taught or experienced in the classroom. If these issues are not addressed, misconceptions will persist and negatively impact students' overall science achievement.

Mastery of reasoning skills is essential for meaningful learning in science. Scientific reasoning is the cognitive foundation that supports students' ability to connect and integrate multiple scientific concepts (Nishaal, Kriek, & Lemmer, 2023). However, informal experiences from daily life may interfere with formal concept formation, leading to misconceptions. For example, Lemmer, Kriek, and Erasmus (2020) demonstrated that when students attempt to modify their understanding without a proper scientific framework, they often apply incorrect reasoning. Misconceptions also arise when students fail to associate interrelated concepts. For instance, when asked to determine the result of mixing two cups of water at the same temperature, students may correctly estimate the total volume but mistakenly assume the temperature doubles, reflecting a misconception that heat behaves like matter. Such misunderstandings are difficult to identify without targeted diagnostic assessment. In Malaysia, fundamental topics such as heat and mass are introduced at the primary school level, making it vital to identify early misconceptions so that teachers can address them effectively.

A more nuanced understanding of matter also requires students to progress through conceptual levels. Wijaya, Nusantara, Sudirman, and Hidayanto (2023) emphasized that analytical thinking is necessary for breaking down information and forming logical reasoning based on scientific evidence. Without a solid grasp of basic concepts, students struggle to comprehend more abstract ideas related to matter and its changes. Similarly, students must first develop descriptive understanding of physical changes before they are introduced to abstract chemical concepts at the molecular and atomic levels (Zhou & Wei, 2020). The ability to reason conceptually about processes such as melting, evaporation, and heat transfer requires instruction that explicitly distinguishes between intuitive beliefs and scientific explanations.

This study aims to identify the patterns and level of misconceptions among primary school students in Malaysia regarding the concepts of matter and heat and to compare these misconceptions with scientifically accepted ideas.

PROBLEM STATEMENT

The ongoing decline in students' performance in science assessments has raised significant concerns about their cognitive abilities and readiness to engage with higher-order thinking tasks. According to the TIMSS 2019 results, Malaysian students scored 466 in science, which remains below the international average of 500, reflecting persistent gaps in skills such as reasoning, application, and analysis (Mullis et al., 2020). This performance trend suggests a limited development of Higher Order Thinking Skills (HOTS), which are essential for students' academic growth and scientific reasoning.

A major factor contributing to this issue is the prevalence of science misconceptions among students. These misconceptions often conflict with scientifically accepted ideas, as they frequently stem from students' prior experiences, personal interpretations, or difficulties in articulating concepts using correct scientific terminology (Shtulman & Legare, 2019). Many students face challenges in mastering basic science concepts due to the disconnect between the theoretical content they are expected to learn and the scientific explanations they actually encounter in the classroom (Sari, Fauzi, & Suwarma, 2021). Additionally, informal life experiences may influence students' understanding of scientific ideas in a way that leads to immature or incorrect concept development.

OBJECTIVES OF THE STUDY

1. To identify the level of misconceptions among students regarding the concepts of matter and heat.
2. To making a comparison between students' misconceptions and scientific ideas on the topic of matter and heat.

RESEARCH QUESTIONS

1. What are the levels of misconceptions faced by students on the topic of matter and heat?
2. Is there a difference between students' misconceptions and scientific ideas on the topic of matter and heat?

METHODOLOGY

Research Design

This research adopts an exploratory quantitative descriptive design grounded in the principles of constructivist learning theory which posit by Piaget (1967) that believed knowledge as the result of life constructive process consist of organize, structure and restructure the experience with the existing thought and gradually modify to expand into new knowledge. This theory also seems related with Vygotsky (1994) which described that the learning of an individual involved a process of exploring initial experience without any guide and been supported by the educator if any. In this study, a comprehension test on the topics of matter and heat was administered to a total of 289 primary school students, comprising 136 students from Year 3 in Perak and 153 students from Year 5 in Selangor. The selection of different states aimed to capture a diverse range of instructional contexts and prior knowledge exposure, which are key variables in constructivist learning environments (Puteh et al., 2021). The instruments used in this study consisted of two sets of open-ended subjective questions designed specifically to identify misconceptions. These instruments were developed based on the Malaysian national science syllabus for Year 3 and Year 5, and were adapted from actual national examination questions. In alignment with constructivist principles, the use of open-ended questions allows students to express their personal understanding and reasoning processes, revealing how they internalize and reconstruct scientific concepts (Agung & Ardianti, 2020).

Research Instruments

The instrument used in this study consisted of two sets of open-ended test questions (Appendix A) focusing on the topics of Matter and Heat. The Concept Test Questions on Matter and Heat were divided into two sections, namely Section A and Section B. Section A contained questions related to students' background information (name, school name, year, gender, and ethnicity). Section B comprised six subjective questions aimed at exploring the level of students' incorrect preconceptions and misconceptions regarding the topics of Matter and Heat. Subjective questions were chosen because they offer greater flexibility and allow most students, including those with lower abilities, to respond freely without feeling restricted (Ali & Ismail, 2021). The development of the test questions was based on the research objectives and the content of the Year 5 Science Textbook, which was modified to suit the cognitive level of Year 3 students. Furthermore, to identify students' incorrect preconceptions and misconceptions about the topics of Matter and Heat, the questions were categorized to facilitate the process of determining the level of each subtopic based on the syllabus descriptions, as shown in Table 1 and 2.

Table 1. Classification of questions for the matter

Question	Classification
1, 4, 5 (circle the picture)	State the condition of the substance
2 and 4 (describe a reason)	Generalize the characteristics of a substance that exist in either solid, liquid or has gas forms
3 dan 6 (give explanation)	Explain the melting of ice and the evaporation of water

Table 2. Classification of questions for the heat

Question	Classification
1 and 4 (select the answer)	Define and state whether the substance is hot or cold
2 (give definition)	Clarify that temperature is the degree of heat
3, 5 and 6 (give explanation)	To correlate the changes in temperature with the expansion and contraction of a substance

Validity and Reliability Test

To ensure content validity and reliability, the instruments were reviewed by two science education experts one from Sultan Idris Education University and another from the Teachers' Training Institute. Both experts are chosen with over 20 years of teaching experience. The expert validation process emphasized clarity, alignment with learning objectives and the potential of questions to elicit students' conceptual frameworks, which is essential in constructivist assessment design (Rahman & Mohamad, 2022). The test was divided into two sections. Section A gathered demographic and background data, while Section B included six open-ended questions targeting the students' conceptual understanding of matter and heat. Subjective questions were chosen over objective formats to allow students the opportunity to articulate their understanding using their own words, which is a key practice in constructivist-aligned assessment (Shaban, 2022; Nurlaelah et al., 2021). Through this format, students demonstrate their individual schema and conceptual organisation, which can uncover hidden or embedded misconceptions that are not easily detected through multiple-choice items. As supported by Shaban (2022), open-ended tests allow assessors to explore not just what students know but how they think. The personalised nature of these responses supports the constructivist idea that knowledge is constructed uniquely by each learner based on their interaction with the content and context (Kadir et al., 2023). Hence, such assessment methods are suitable for uncovering deep-rooted conceptual misunderstandings and facilitating more meaningful intervention strategies.

Testing and retesting of the instrument were conducted on the research instrument and a reliability coefficient value of r >0.8 was obtained as displayed below in Table 3.

Table 3. Correlation value, r for test-retest reliability

Test and retest	Min	Number of items (Retest items)	Correlation value, r
Percentage of Students' Score for Year 3 (Matter topic)	10.70	3	0.824
Students' Score for Year 5 (Matter topic)	21.67	3	0.868
Percentage of Students' Score for Year 3 (Heat topic)	21.40	3	0.843
Percentage of Students' Score for Year 5 (Heat topic)	32.80	3	0.906

The open-ended test was developed based on the official Year 3 and Year 5 science syllabus**.** Based on the content validity test data shown in table 1 and 2 above, the instrument was reviewed by two expert science educators (one from Sultan Idris Education University and one from a Teacher Training Institute), both with over 20 years of teaching experience**.** Their feedback likely ensured that the test items were clear, age-appropriate and aligned with the conceptual objectives of the curriculum. This approach aligns with research suggesting expert review is a reliable method for ensuring content validity in education assessments (Noto & Handayani, 2022; Sari et al., 2023). While for the reliability test of instrument, table 3 shown correlation, r and mean value to indicates the reliability value of instrument used. According to Cohen's (1988) conventions, all correlation values are above 0.80, representing very large effect sizes and generally interpretd as strong to excellent reliability in applied research.

The instrument consistently captures students' misconceptions in both topics. This shows that the students' responses were stable over time which is crucial for an open-ended test where variability in interpretation and scoring can be a concern. The use of subjective questions, while valid for probing conceptual understanding, must also maintain consistency. Subjective questions, when accompanied by scoring rubrics can consistently asses student's conceptual understanding, ensuring reliability in evaluation (Subramaniam & Sapri, 2022). Additionally, when presented in the form of HOTS (Higher Order Thinking Skills) questions, they effectively probe deeper cognitive processes, provided they are consistently aligned with the intended learning goals (Raflee & Halim, 2021). In context of open-ended test, it is suitable to use because open-ended questions are effective tools for diagnosing misconceptions, especially in science, because they allow students to explain reasoning in their own words. Open-ended tests are highly suitable for assessing students' understanding in science education, particularly when the aim is to identify misconceptions. These questions allow students to express their understanding in their own words, providing researchers with deeper insight into how students conceptualize scientific ideas. Unlike multiple-choice items, open-ended responses reveal students' reasoning processes and allow for the detection of specific misunderstandings that might otherwise remain hidden. This type of assessment encourages learners to articulate cause-and-effect relationships, apply prior knowledge, and demonstrate the integration of scientific concepts, all of which are crucial for meaningful learning. From a constructivist perspective, open-ended assessments align well with the belief that learners actively construct knowledge based on their experiences and existing understanding (Rahman & Mohamad, 2022).

FINDINGS AND DISCUSSION

In analysing the research data, a descriptive statistical method was used to estimate the frequency and percentage. The answers provided by students in Section B were evaluated according to the available grading scheme and the overall score was based on the percentage of wrong answers. From this percentage, the level of misconception was determined as shown in Table 4.

Table 4: Students' misconception level

Percentage of wrong answers	Level of misconception
70-100	High
40-69	Average
0-39	Low

The data was then qualitatively analysed by listing and discussing the answers provided by students that frequently indicated misconceptions. Finally, the actual answers were discussed and compared to the grading scheme which was developed according to the primary school science syllabus.

Level of Students' Misconception on Matter and Heat Concepts

Data analysis showed students in Year 3 and Year 5 experience substantial misconceptions on matter and heat. Table 5 presents the overall average percentage of wrong answers provided by students for the questions related to the matter topic.

Table 5: Overall average percentage of wrong answers on matter

Questions	Percentage of wrong answers by students	
	Year 3	Year 5
1. Circle the picture	27.2	18.0
2. Describe a reason	99.6	99.4
3. Give explanation	97.4	93.3
4. Circle the picture	33.6	21.8
4. Describe a reason	100.0	99.4
5. Circle the picture	97.6	92.9
6. Give explanation	99.7	99.7
Average percentage	**79.3**	**74.9**

Based on Table 5, the findings demonstrate the level of misconception among Year 3 students is high with average percentage of wrong answers on matter is 79.3%. for Year 5 students, the average percentage of wrong answers on matter is 74.9% which is not much different from Year 3 students. Therefore, the level of misconception for Year 5 students is quite similar to Year 3 students.

Meanwhile, the overall average percentage of wrong answers on heat is 79.6% (Table 6). This shows that the level of misconception among Year 3 students on heat is high. Meanwhile for Year 5 students, the overall average percentage of wrong answers on heat is 66.1% which could be considered at a moderate level.

Table 6: Overall average percentage of wrong answers on heat

Questions	Percentage of wrong answers by students	
	Year 3	**Year 5**
1 Select the answer	27.5	12.6
1. State the reason	98.7	96.2
2. State the reason	100.0	18.8
3. Draw a picture	87.5	76.0
3. State the reason	98.9	98.3
4. State the reason	76.0	67.1
5. Circle the answer	42.3	48.4
5. State the reason	97.3	96.3
6. Make an observation	67.7	48.0
6. State the reason	99.8	99.0
Average percentage	**79.6**	**66.1**

Comparison between misconception of students and scientific ideas

Our results indicate that students have problems in describing the condition of a substance. Among the frequent answers was visualising a solid as a jelly or gum. Many students also portray ice to be categorised as liquid and not solid. The answers given by students are incorrect because ice does have some characteristics of solid; ice cannot be compressed, cannot flow through and cannot adhere to the shape of a container.

Most students failed to explain the attributes that represent all the conditions of a substance when they were expected to generalize these attributes. As an example, students said that solids have the attributes of hardness, sharpness, strength, and consider solid as something that has the properties of iron. This is due to their tendency of assuming solid as a hard and strong material. Moreover, students perceive that the concept of solid is based on the word “solid” since a group of students answered that solid is ‘something solid’. Most students could not explain the scientific attributes and characteristics accurately even though they have ideas about the substance.

In describing reasons for the condition of a substance, most Year 5 students could not provide answers aligned with scientific ideas, despite having been exposed to formal instruction on the topic. For instance, some students identified factory smoke as water vapour when, in fact, it is composed of gas particles that move freely and occupy space. This misconception likely arises because students develop personal meanings that diverge from scientific perspectives even before formal learning begins. Recent studies suggest that such misconceptions are often formed during early cognitive development and are deeply influenced by prior experiences and intuitive beliefs (Sari et al., 2021; Tekkaya et al., 2020). Furthermore, Misbah, Gul, and Saeed (2021) demonstrated that misconceptions are shaped through gradual stages, evolving as students attempt to make sense of scientific phenomena using non-scientific frameworks.

In the case of phase changes, most students described ice melting as simply "turning into liquid," without elaborating on the process of melting itself. Similarly, their explanations of evaporation lacked scientific terminology and understanding. Common answers included "a wet garment dries in the sun," "water becomes smoke," and "wind dries clothes." These examples illustrate a reliance on everyday experiences rather than scientific reasoning. This aligns with the concept of "everyday knowledge misconceptions", where students interpret scientific phenomena through familiar but inaccurate analogies, a phenomenon described by recent researchers such as Wijaya and Hidayanto (2023).

Regarding the topic of heat, when asked to define or explain whether a material is hot or cold, students frequently answered with statements such as "heat makes a material feel hot," or "scorching heat makes something hot." When asked about the concept of heat itself, they often responded with "hot," "vapour," "cloud," or "smoke." These responses suggest a lack of understanding that heat is a form of energy. Many students continue to visualize heat as a physical substance, such as mist or fog, rather than as energy transfer between objects, a misconception widely observed across age groups (Lemmer, Kriek, & Erasmus, 2020).

To explain the effect of heat on materials, some of the questions included requesting students to draw a picture and clarify the reasons based on the picture drawn. For example, they sketched a picture of an electric cable in a tensed situation and among the reasons given is 'hot weather will make an electric pole feel hot' and 'when it is hot, the electric cable will be tensed." The reasons given did not correlate with the scientific ideas illustrated in the sketches even though students are supposed to relate the changes in temperature with the expansion and contraction of materials. Nevertheless, students seem to have basic understanding in the application of heat on the expansion and contraction on railway lines that they may have obtained through informal learning of a life experience.

The level of misconception among Year 3 students was high for both topics, 79.3% on matter and 79.6% on heat. Similarly, the level of misconception among Year 5 students on matter was high (74.9%), but the level of misconception on heat decreased to 66.l% which immediately ranked their level of misconception at a medium level.

IMPLICATION OF THE STUDY

This study provides valuable insights into students' misconceptions about matter and heat, which carry significant implications for science education, particularly in the areas of teacher training and curriculum development. By identifying the level and patterns of these misconceptions, educators and stakeholders are better positioned to design and implement teaching strategies that directly address students' cognitive errors and improve conceptual clarity in science instruction.
In the context of teacher training, the findings underscore the need for targeted professional development programs that equip teachers with diagnostic skills to identify and respond to misconceptions effectively. Pre-service and in-service training should emphasize pedagogical content knowledge (PCK) that integrates both scientific content and strategies for conceptual change. Teachers must be trained to recognize common alternative conceptions, use formative assessments such as open-ended and diagnostic tests, and implement inquiry-based or constructivist teaching methods that promote conceptual understanding. Furthermore, this study highlights the importance of training teachers to facilitate classroom discussions that encourage students to confront and resolve their misconceptions through guided reasoning, experimentation, and reflective dialogue. From a curriculum development perspective, the study suggests a re-examination of how abstract science concepts, such as matter and heat, are introduced and sequenced across year levels. Curriculum designers should ensure that foundational scientific concepts are introduced in a developmentally appropriate manner, using concrete experiences and visual models to support student understanding. The curriculum should also include explicit attention to common misconceptions, with embedded activities that challenge incorrect notions and provide opportunities for students to test their understanding in real-life contexts. Additionally, curriculum materials should support teachers with resources and scaffolding tools that

align with constructivist principles, such as concept mapping, analogical reasoning, and problem-based learning. By comparing students' misconceptions with scientifically accurate ideas, the study also exposes potential gaps in instructional delivery, suggesting the need for pedagogical shifts that go beyond content delivery toward conceptual development. These improvements in both teacher preparation and curriculum design are essential to fostering Higher Order Thinking Skills (HOTS), enabling students to analyze, apply, and evaluate scientific knowledge rather than merely recall facts. Ultimately, the study contributes to a more responsive and effective science education system, one that supports deep learning, nurtures critical thinking, and prepares students to engage with complex scientific issues in everyday life.

CONCLUSION

In conclusion, the study showed the existence of misconception on matter among students. However, the magnitude of this misconception has decreased in Year 5. Students also experienced difficulties in explaining the properties of matter. In addition, they tended to provide their own justification about the process of change in matter without associating the justification with a scientific idea. The overall findings indicated the existence of misconception on heat for Year 3 and Year 5 students. Data revealed the level of misconception for the heat topic among Year 5 students is lower compared to students in Year 3. The majority of students faced problems in explaining the causes and relating temperature changes with expansion and contraction in the heat topic. This misconception problem should not be regarded as something trivial because the problem would probably snowball and continue to affect students' understanding of science concepts. To overcome this problem of misconception among primary school students, educators should review and improve science pedagogy implemented in schools so that it becomes more suitable with the level of students. Clear pedagogical input from teachers about a science concept is crucial in ensuring efficient delivery of science in classroom. This current study assists teachers to improve their pedagogical skills in the science subject and further enhance the quality of teaching and learning at schools.

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APPENDIX

BORANG SOAL SELIDIK UNTUK MURID

Soal selidik ini adalah bertujuan untuk mendapatkan maklumat mengenai

PERLAKSANAAN KURIKULUM SAINS KBSR DI SEKOLAH RENDAH

Soal selidik ini mengandungi 8 (lapan) mukasurat yang terbahagi kepada dua (2) bahagian: Bahagian A dan Bahagian B

Bahagian A: Maklumat murid

Bahagian B: Soalan sains berkaitan dengan konsep jirim

Sila berikan responden terhadap semua pernyataan dalam setiap bahagian, dengan ikhlas sebagaimana yang dikehendaki.

Segala maklumat yang anda berikan **dirahsiakan.**

Kerjasama anda didahului dengan ucapan terima kasih

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SARIPAH SALBIAH SYED ABDUL AZZIZ, PhD., Dr.,
HAFSAH TAHA, PhD., Dr.,
KHAIRUL BARIYAH ABD KADIR,

Fakulti Sains dan Matematik UPSI

BAHAGIAN A

MAKLUMAT MURID

ARAHAN: Sila berikan maklumat mengenai diri anda, sama ada dengan menandakan (/) dalam kotak yang berkenaan atau mengisi ruang kosong yang disediakan, bagi setiap pernyataan

1. Nama : …………………………………………………………………………

2. Nama Sekolah : …………………………………………………………………………

3. Jantina : Lelaki ☐
   Perempuan ☐

4. Tahun : Tahun 3 ☐
   Tahun 5 ☐

5. Keturunan : Melayu ☐
   Cina ☐
   India ☐
   Lain-lain: Sila nyatakan ……………………………. ☐

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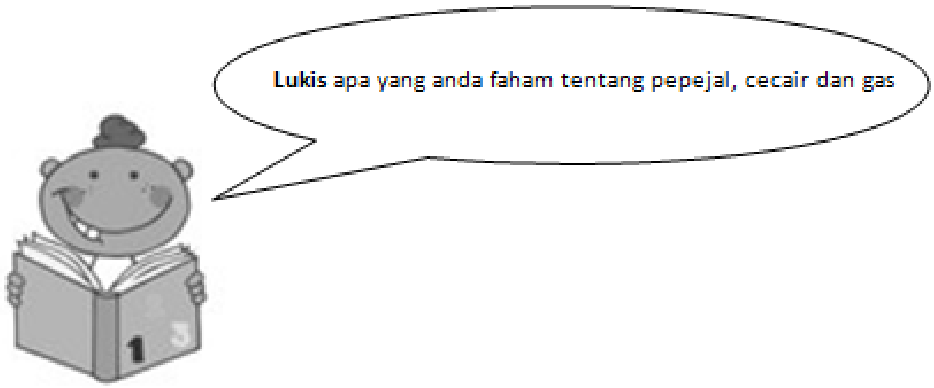
BAHAGIAN B

ARAHAN:

Jawab semua soalan. Tuliskan jawapan kamu dalam ruang yang disediakan.

1.

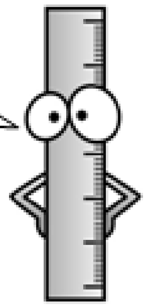


pepejal	cecair	gas

2. Sila **penuhi tempat kosong** dengan jawapan yang sesuai.

Berikan **4 perkara** mengenai sifat pepejal

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________



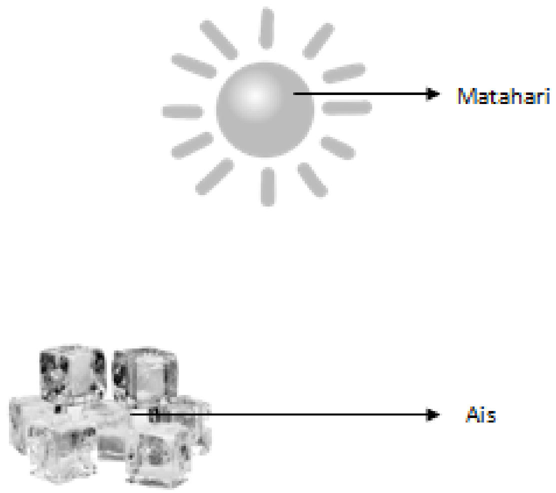
Berikan **5 perkara** mengenai sifat cecair

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________

Berikan **5 perkara** mengenai sifat gas

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________

3. **Lengkapkan** tempat kosong berdasarkan gambar dibawah.



Ali mengambil ais di dalam peti sejuk dan meninggalkannya di bawah sinaran matahari. Ais adalah dalam bentuk_________________. Selepas beberapa minit, ais tersebut akan ______________________ dan membentuk keadaan ________________Jika Ali meninggalkan ais lebih dari sehari, ais tersebut akan _______________________ kerana la bertukar dari _______________kepada keadaan ______________________.

4. **Bulatkan** gambar yang betul berdasarkan soalan dibawah dan berikan **satu** sebab berdasarkan pilihan anda.

a) Apakah bahan yang diperbuat daripada cecair? **Bulatkan** jawapan anda.


Air minuman


Paku


Pemandangan


Asap kilang


Muzik

Nyatakan **satu** sebab:

____

____

b) Apakah bahan yang diperbuat daripada gas? **Bulatkan** jawapan anda.


Air minuman


Paku


Pemandangan


Asap kilang


Muzik

Nyatakan **satu** sebab:

____

____

c) Apakah bahan yang diperbuat daripada pepejal? **Bulatkan** jawapan anda.





Air minuman | Paku | Pemandangan | Asap kilang | Muzik

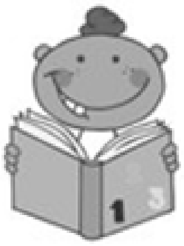
Nyatakan **satu** sebab:

____

____

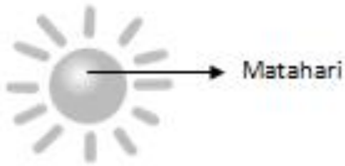
5.

Lengkapkan tempat kosong dengan jawapan yang sesuai.



Pepejal mempunyai ________ tetap dan ________ tetap. Cecair mempunyai ________ tetap, ________ tetap dan ________ bentuk bekas. Gas mempunyai ________, ________ tidak tetap, memenuhi ________ dan boleh di ________.

6. **Jawab** soalan berikut berdasarkan gambar dibawah.



Terangkan secara terperinci langkah demi langkah bagaimana baju itu dapat mengering apabila dijemurkan dibawah cahaya matahari.

1.____

2.____

3.____

4.____