

# **CAT 4 RESOURCE DEVELOPMENT**

**Group 4-042**

## **Science is Fun**

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## **Abstract**

“Science Is Fun” consists of a card game that allows Primary 6 students to revise Science through a fun and enjoyable way for PSLE, a website that covers the detailed instructions on how to play the card game, some examples of our cards, as well as a set of the printable card game. The card game consists of the hardest topics of each of the 5 themes of science. This package has detailed explanations which is very important for them as they will need to be able to understand how the game works. The card game is very fun and engageable which we have meticulously crafted towards the topics that the students felt were tougher to comprehend.

## **1. Introduction**

### **1.1 Rationale**

Science is one of our favourite subjects, and we wanted to make learning it easier and fun! With our card game, Primary 6 students are able to revise some of the Science topics and be more engaged in the learning process. We also hope that this will allow them to gain a greater interest in Science.

### **1.2 Objectives**

The objective of this resource is to let students learn in a fun and engaging way, which can capture their attention so that they can absorb the information better instead of studying from a mundane textbook or revision card which can cause them to dream or be too bored to bother memorising anything.

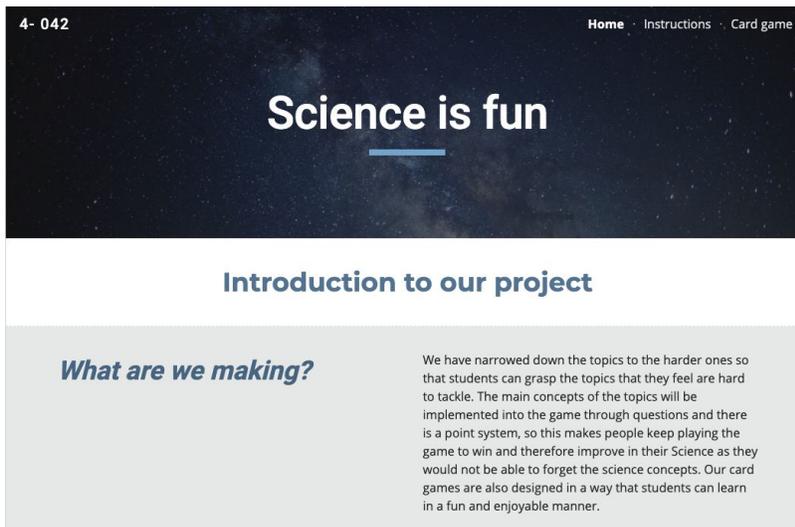
### **1.3 Target Audience**

The target audience of our project is Primary 6 students who face difficulties with Science, require help and want to learn in an alternative way like having fun through the use of a card game.

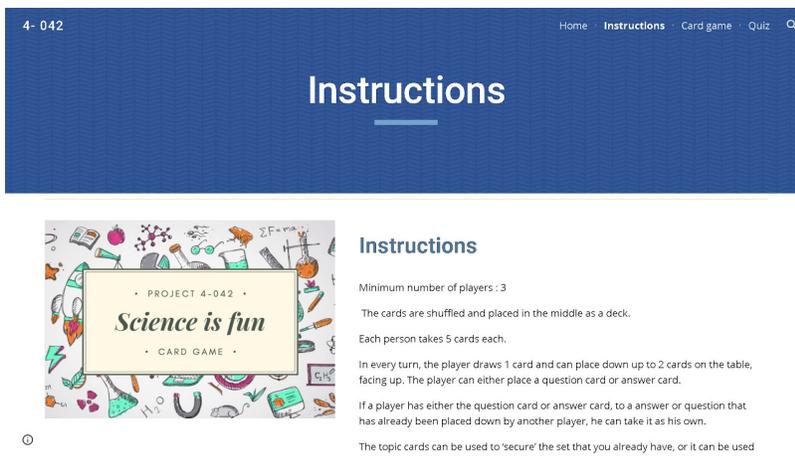
## 1.4 Resources

The resources included are a card game and a website which includes a homepage, instructions page and the card game in PDF. We printed out the card game and laminated them. Our website includes the home page, instructions, printable card game and a quiz. Link to website: <https://sites.google.com/student.hci.edu.sg/4-042>

The home page of our website shows our objectives, and a to navigate the website



The instructions page shows how to play the game as well as a video on how to play



The topic cards can be used to 'secure' the set that you already have, or it can be used to take a set of question and answer from another player. When a set has a topic card, it cannot be taken.

A question, answer and topic card is considered as a set. First player with 3 sets win.

### Video of how the game works

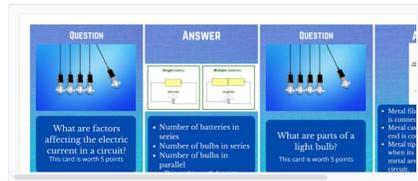


This is an example of our card game

The card game page contains a printable version of the card game.

## Card game

### Printable Version



Systems - Electrical systems

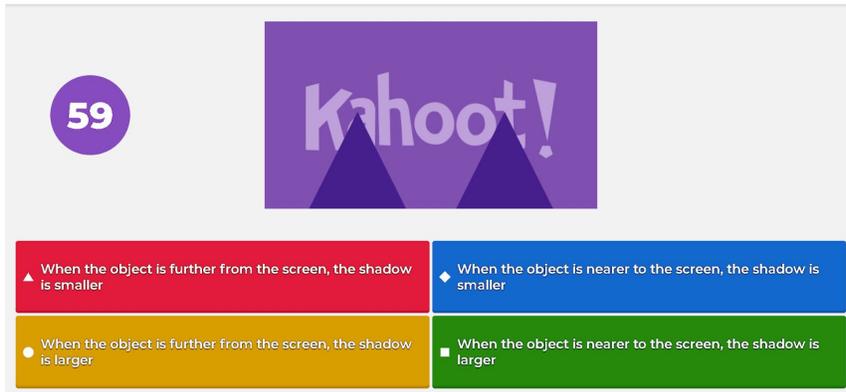
The quiz page has a link to a quiz on kahoot for them to check their knowledge after playing the game.

## Quiz

This quiz on Kahoot is for you to check your revision. Do this by yourself or with a friend as some of the questions have been covered in the card game.

[bit.ly/30E5180](https://www.kahoot.it/join/30E5180)

How is the size of shadow affected when the distance between the torch and object changes?



These are examples of the card game that we made



## 2 Review

### 2.1 Literature review

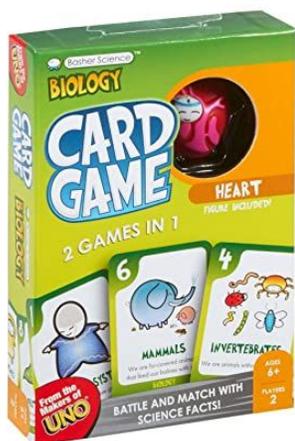
We did a literature review and had two main findings. Firstly, card games are more effective than traditional methods. An experiment was conducted at Bulacan State University–Sarmiento Campus and the subjects were 2 of its biology classes in 2014. Both classes received conventional instruction; however, the experimental group instruction was supplemented with the card game, while the control group instruction

was reinforced with traditional exercises and assignments. Gutierrez (2014) showed that both methods effectively reinforced biological concepts and increased the students' score but the games are more effective than traditional teaching methods. We also found out that games can develop a positive attitude towards studying. Yunjo An (2016) showed that 73% of 111 participants had used computer games in teaching.

Participants who had used computer games in teaching had more positive attitudes toward the use of educational computer games in the classroom than those who had not used games.

## 2.2 Market review

There were already revision cards and some existing card games in the market. The revision cards only had information which is basically a card version of the textbook. Some of the card games include profound facts about Science which are usually out of the PSLE syllabus and they are mostly pictures.



Product	Pros	Cons
Science fact cards	<ul style="list-style-type: none"> <li>Includes interesting facts about Science</li> </ul>	<ul style="list-style-type: none"> <li>The facts are not relevant to Primary School Science</li> </ul>

Basher science card pack	<ul style="list-style-type: none"> <li>● Includes facts about Science</li> <li>● Looks aesthetically pleasing</li> </ul>	<ul style="list-style-type: none"> <li>● Includes only 24 cards which is too few</li> </ul>
Revision flashcards	<ul style="list-style-type: none"> <li>● Includes things that may be tested in PSLE Science</li> </ul>	<ul style="list-style-type: none"> <li>● Very boring and does not capture a students attention</li> </ul>

### **3 Methodology**

#### **3.1 Needs analysis**

A needs analysis was conducted to find out the need for this resource and which topics should be included. Approximately 80 responses were collected. Through the survey, we realised that existing resources that the students had were not as engaging as a card game and they felt that a card game would be a great idea for them to learn in an alternative and fun way. We also specially designed the card games to include the topics that they felt were tough for them to comprehend.

#### **3.2 Survey results**

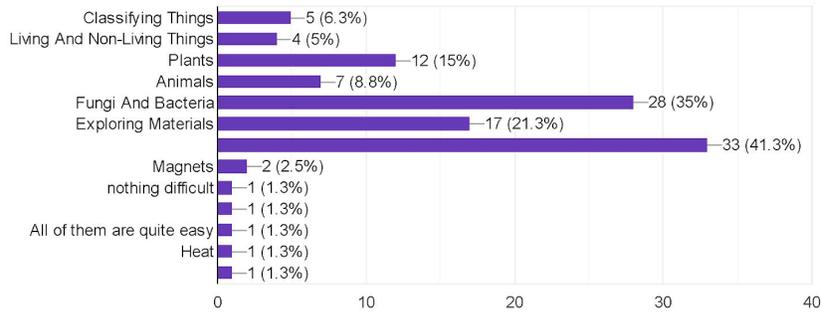
We surveyed 80 primary 6 students on what they found was the hardest topic of each theme:

- Diversity - Fungi and bacteria
- Cycles - The water cycle
- Systems - Electrical system
- Interactions - Adaptations
- Energy - Light and shadows

We also found out that they prefer a card game and website.

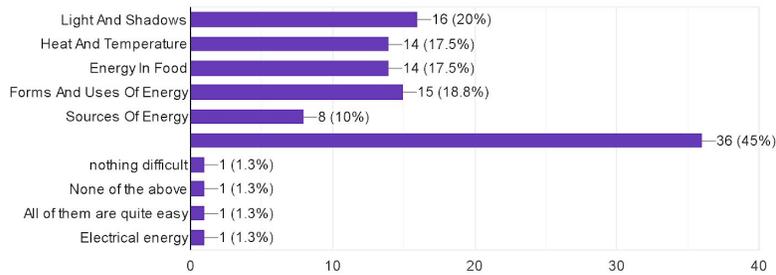
Which Science topic(s) do you find the hardest for Diversity? (You may tick more than 1 box)

80 responses



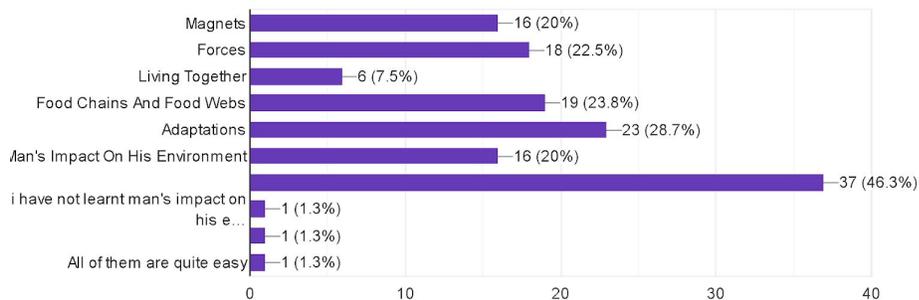
Which Science topic(s) do you find the hardest for Energy? (You may tick more than 1 box)

80 responses

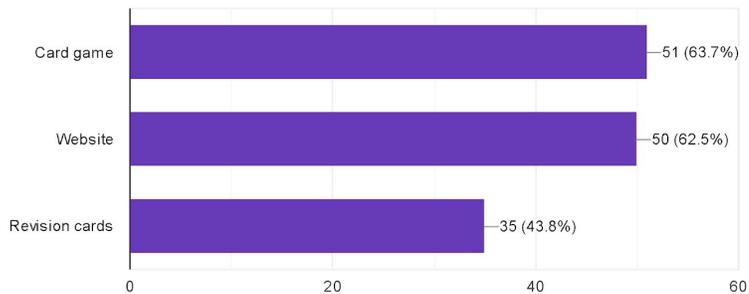


Which Science topic(s) do you find the hardest for Interactions? (You may tick more than 1 box)

80 responses



What resource would be helpful for you? (You may tick more than 1 box)  
80 responses



### 3.3 Development Of Resources

We reviewed some Primary 6 Science questions from past-year papers and used the questions in our card game. We also ensured that the answers for the questions were correct by using the model answer. Pictures were added in the cards as well to make it look more exciting. We helped them revise the basic concepts through simple questions followed by more difficult questions that involved application of the concepts.

### 3.4 Pilot test

We tested our product on some primary 6 Science teachers and Primary 6 students.

We managed to survey two Primary 6 teachers, Ms Li and Ms Cheong. Ms Li, a MOE science teacher in a primary school said that she has observed “great effort” in coming up with the cards and that she “personally liked the real-life application questions”. She feels that more of such questions can be considered. She even commented that the cards are “colourful, interactive and engaging”. Ms Cheong, a science tutor for PSLE students, said that she can tell a lot of effort has been put into the creation of the cards; the answer cards have “a lot of content, colourful pictures, varied fonts, variation of themes across different topics”. The teachers also think it will be very useful for helping students revise and effective in making the topics interesting. They also gave suggestions that the phrasing and grammar of some cards can be better.

How useful do you think this card game is in helping your students to revise for Science? \*

1 2 3 4 5

Not useful      Very Useful

How effective do you think this card game is in making the Science topics more interesting? \*

1 2 3 4 5

Not at all     Very effective

We wanted to go to a primary school to carry out a proper trial run, but was stopped due to the COVID-19 situation, so instead we tested on Tristan's brother, Gabriel and a small group of his friends and we let them play the cards. They said, "It's very neat and it really answers my questions on some topics.". They also think it is useful for revision and is effective in making the topics interesting. The students gave suggestions to rephrase the cards so it would be clearer to them.

How useful is this card game in helping you to revise for your Science test? \*

1 2 3 4 5

Not useful     Very Useful

How effective is this card game in making the Science topics more interesting? \*

1 2 3 4 5

Not at all     Very effective

#### 4 Outcome and discussion

The feedback we received was generally quite good, especially from the teachers as they praised our efforts. We considered the feedback given to us very seriously and decided to include some real-life questions into the cards since they are really common in exam papers to test students' applications of the concepts. We corrected our English a bit more to make sure it is easier to understand. Our cards were quite well-liked by the teachers and students we surveyed so we proceeded with it.

## 5 Conclusion

In a nutshell, from the feedback given by the students as well as the teachers that reviewed our product , it is proven that our product has met its objectives which was to help Primary 6 students prepare for PSLE Science while making the process of learning Science fun and interesting. However, there are a few areas on our card that we can improve on such as the lack of real-life applications of different concepts and questions that will usually come out in exams. Overall, there was more positive feedback than negative feedback which shows that our product has successfully accomplished our objective and can do better after improving it according to the comments that were given. We also made a video for the students to understand the card game better since they commented that it may not be that easy to understand at first look. In addition to learning what we can do to improve our product , we also learnt about the importance of teamwork and coordination to be able to make this project work a success . We would also like to thank our mentor Ms Tan for her constant guidance and advice that helped us in some parts of our project .

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