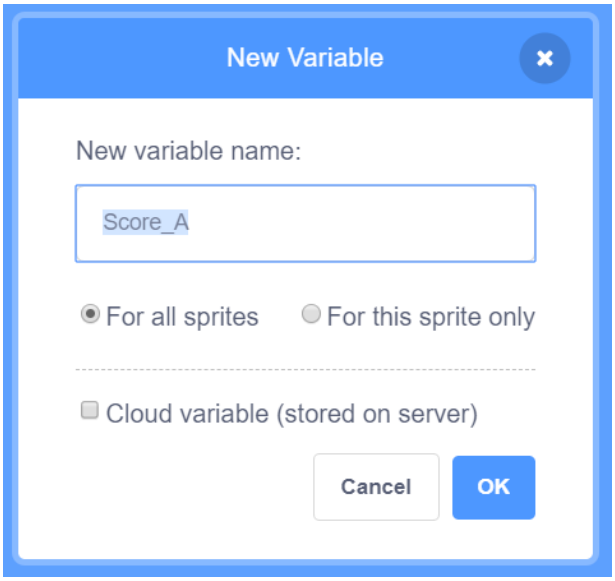
L1U8.3
Unplugged Activity: Variables

What are variables?

Variables are used to store values. Variables have the following properties.

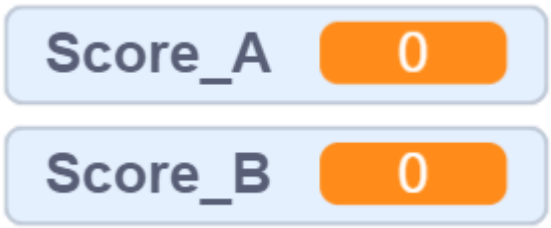
- **Variables have names.**



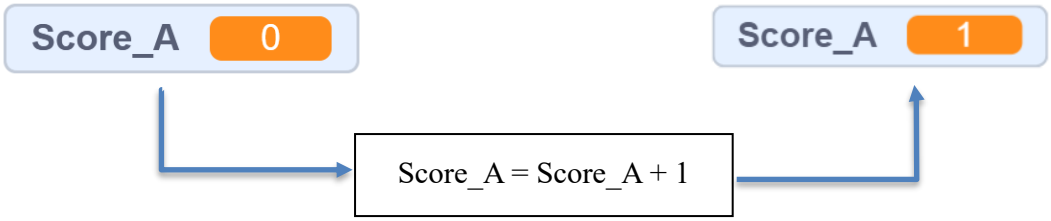
- **A variable can only store one value at a time.**

❖ **The variable should have an initial value.**

When the game starts, the value of Score_A, and Score_B are reset to 0.



❖ **The value of the variable can be updated.**



❖ **The value of the variable can be a string, or a number.**

Score_A = 3

Score_B = 1

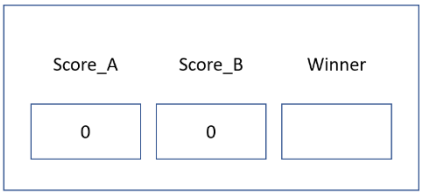
Winner = "A"

Who will be involved?

Two students will play a game and one student helps them keep track of the game using variables (**Score_A**, **Score_B**, and **Winner**).

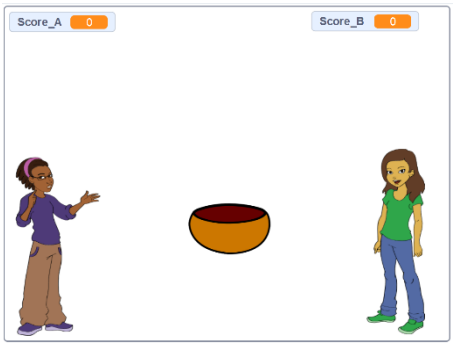
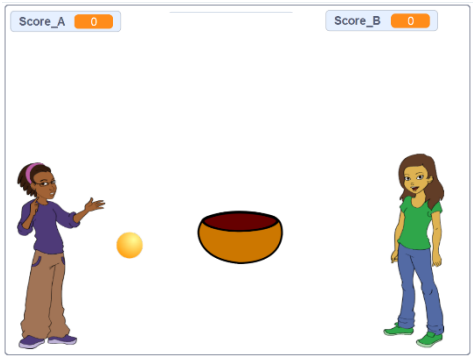
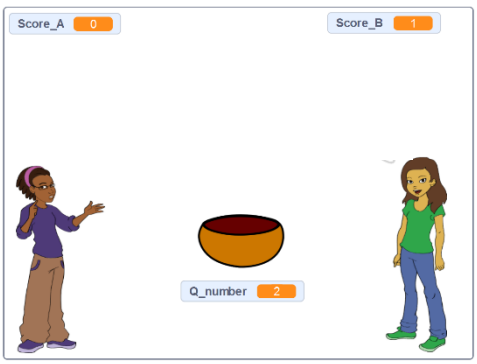
What do we need?

- Set of 6 question cards with answers on the back.
- Set of index cards to use for variable values.
- Whiteboard for writing down current variable values.



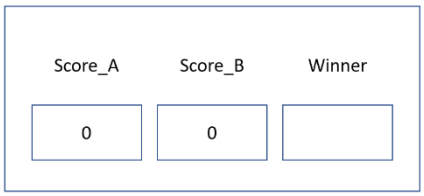
Using by	**Tools**
Student A	Student A & B will take turns in the game below: Student A picks a number card from the Question box, then goes to the table to pick the card on the table based on the number they drew from the Question box. Student A speaks out the question printed on the card loudly and Student B needs to give the answer. Student A will tell Student C if Student B's answer is correct. The process is reversed on the next round. Student B picks the card, asks the question, and Student A answers.
Student B	
Judge	<u>Correct answer</u> If Student A answers a question correctly, add 1 to the existing variable "**Score_A**" and add 1 to the existing score of "**Score_B**" if Student B answers a question correctly on their turn. <u>Incorrect answer</u> If Student A answers the question incorrectly, subtract 1 from his/her existing score (**Score_A**), unless the score is 0. **Score_A** should never become negative. If Student B answers their question incorrectly, subtract 1 from his/her existing score (**Score_B**), except if their score currently is 0. Once the game finishes, the letter for the student with the higher score will be written under the **Winner** label on the whiteboard.

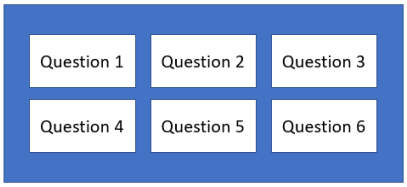
How does it run? https://scratch.mit.edu/projects/363328697/

	Score_A	Score_B
At the beginning of the game, the two scores are reset to zero. 	0	0
Student takes a turn to ask a question. The other student will need to answer the question. Student A asks the first question. Correct answer will score 1 point. 	0	If Student B answers correctly, judge will update **Score_B = Score_B + 1**. If Student B answer incorrectly, judge will update **Score _B= Score_B – 1**. **Or remain 0 if already 0**.
After answering the question, Student B will ask a question and Student A needs to answer the question. The score calculation will be the same. The game ends until there are no more questions. 	If Student A answers correctly, judge will update **Score_A = Score_A + 1**. If Student A answer incorrectly, judge will update **Score_A = Score_A – 1**. Or remain 0 if already 0.	1

Procedure

(1) Judge: (a) Write down three labels, **Score_A**, **Score_B** and **Winner,** on the whiteboard; (b) Give an initial value of zero (0) to **Score_A** and **Score_B**, and remove anything written under the **Winner** label; (c) put 6 question cards on the table.





(2) Student A: Randomly picks a card from the table and speaks out the question loudly to Student B.

(3) Student B: Answers the question asked by Student A.

(4) Student A: Acknowledges to the Judge if Student B's answer is correct.

(5) Judge: If Student B's answer is correct, calculate the new Score_B by adding 1, erase the number written under the score_B label, and write the new number under the **Score_B** label on the whiteboard. If the answer is incorrect, and if **Score_B** is greater than zero, the Judge calculates the new **Score_B** by subtracting 1, erasing and marking the new **Score_B** under the **Score_B** label on the whiteboard.

(6) Student B: Randomly picks a **Question** card from the table and speaks out the question loudly to Student A.

(7) Student A: Answers the question asked by Student B.

(8) Student B: Acknowledges to the Judge if Student A's answer is correct.

(9) Judge: If Student A's answer is correct, adds 1 point to **Score_A**. If the answer is incorrect, and if **Score_A** is greater than zero, the Judge subtracts 1 from **Score_A**.

Repeat steps (2) to (9) to continue the game until no more cards can be drawn from **Questions** on the table.

If Student A has the higher score, then the Judge write "A" under the **Winner** label on the whiteboard. The Judge then announces, "Student A is the winner and they have a score of [Score_A].

If Student B has the higher score, then the Judge write "B" under the **Winner** label on the whiteboard. The Judge then announces, "Student B is the winner and they have a score of [Score_B].

If the scores are the same, the Judge write "None" under the **Winner** label on the whiteboard and announces, "The game is a tie".

Summary of What We Learned

- **Variables have names.**

  Score_A

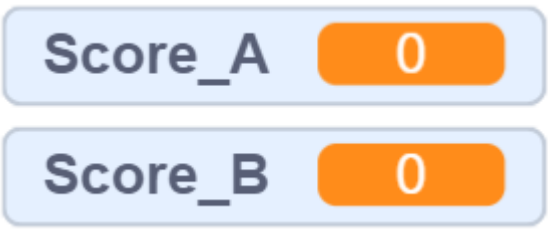
  Score_B

- **A variable can only store one value at a time.**

  Score_A = 1

- **The variable should have an initial value.**

  When the game starts, the value of Score_A, and Score_B are reset to 0.



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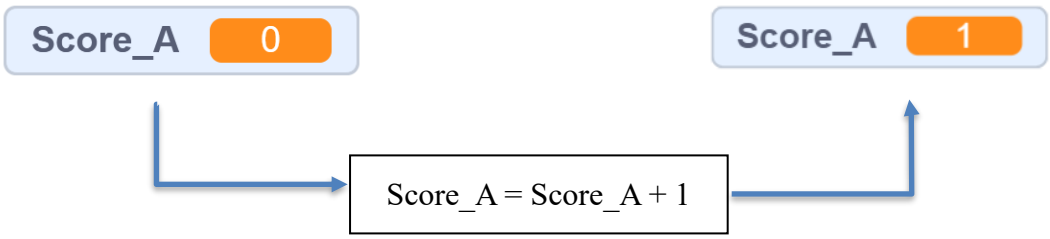

- **The value of the variable can be a string, or a number.**

  Score_A = 3

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  Winner = "A"