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Activity Guide - Representing Information



Storing Information

Activity 1

In this activity, you will store your “yes” or “no” answers to the following questions in your deck of cards. You can use as many or as few cards as you want to store your answers.

First, you and your parent/sibling/friend must decide on how you will encode a “yes” or a “no” using only playing cards. Discuss with your parent/sibling/friend and write down your encoding scheme below.

Yes: black cards No: red cards

Now, read the following questions, and fill in the chart with your “yes” or “no” answers and the way you would store the answer using the playing cards. Do not let your parent/friend/sibling see you as you complete below.

	<u>Y</u>	<u>N</u>
Are you wearing any green today?		
Do you have a pet at home?		
Did you go to bed before ten last night?		
Do you like to play soccer?		
Can you walk to school?		

Now, store your answers in a set of cards and exchange give this set of cards to your parent/sibling/friend. Ask them each of the following and have them answer based solely on the set of cards you gave them, not what they know about you. Record how they answer below.

Are you wearing any green today?	<u>Yes</u>
Do you have a pet at home?	<u>No</u>
Did you go to bed before ten last night?	<u>No</u>
Do you like to play soccer?	<u>Yes</u>
Can you walk to school?	<u>No</u>

Did they retrieve the answers correctly?

Yes

Activity 2

Of course, we need more than just “yes” or “no” when we store information.

In this activity, you will develop a set of rules for storing the letters of the alphabet. Fill out the following chart with how you will encode each of the letters so that they can be stored in the cards. Next come up with a 4-8 letter word. Store this word in a stack of cards and give the stack to your parent/sibling/friend. Let them use your system and cards to see if they can figure out your word.

A: black A
B: red A
C: black 2
D: red 2
E: black 3
F: red 3
G: black 4
H: red 4
I: black 5
J: red 5
K: black 6
L: red 6
M: black 7

N: red 7
O: black 8
P: red 8
Q: black 9
R: red 9
S: black 10
T: red 10
U: black J
V: red J
W: black Q
X: red Q
Y: black K
Z: red K

Information Retrieval

Questions:

Were they able to retrieve your word correctly?

Yes

Is there anything you need to change about your rules (or code for each letter)?

Because the system
worked, no.

Would your code work if there were two of any letter in the word?

Yes because there
are multiple red 2's, for example, in a deck
so there are cards available for
double letters. However,
triples wouldn't be
possible.

Activity 3

This time the only information you can use the cards is whether they are face up or face down.
Write the code for each letter in the chart below, using "U" for face up, and "D" for face down.

A: UUUUD

B: UUUDU

C: UUUDU

D: UDUUU

E: DUUUU

F: DUUUD

G: DUUDU

H: DUUDU

I: DDUUU

J: DDUUD

K: DUUDU

L: DDUDU

M: DDDUD

N: DDDDU

O: DDDDD

P: DUDUD

Q: DUDDU

R: DUUDD

S: DUDDD

T: UDDDU

U: UDDUU

V: UUDDU

W: UDUDD

X: UDDUD

Y: UUUUU

Z: DDDDD

Now, come up with a 6-10 letter word. Store that word in only ONE STACK of cards. Remember each letter in your word should use 5 cards- so if you have a 10 letter word, you should have a stack of 50 cards.

Information Retrieval

Have your parent/friend/sibling use your rules to retrieve the message from your deck of cards. You may want to write down the sequence of face up and face down cards first. Have them what they think the word is below.

O P E R A T E
DDDDD DUDUD DUUUU DUUDD UUUUD UDDDU DUUUU

Questions:

How did changing the definition of the problem change your plan to solve it?

More options for each card forced me to use more objects to demonstrate each step. For example, instead of using colors for a two option choice, I had to use 5 cards for a letter to create a word.

You were given about five cards to store each letter. Could you have completed the challenge if you'd only had three cards per letter? Why or why not?

NO, because $2 \cdot 2 \cdot 2 = 8$ meaning
there are only 8 letters
possible to create with the deck, and
one needs over 26 options to do the
activity.