

C4.3 You need light to see

Ben wants to dress up as a pirate so of course, he'll have an eye patch. "It's a good thing you aren't a real pirate, or else you would have only one eye," Mia teases. "Says who?" Ben replies. "Don't you know that there were pirates who wore eye patches just so that they could see better below deck? Then one eye was already used to the dark inside the ship."



Find out what you can see in the dark.



Write down your ideas and guesses:

You need the following for the experiment:

- several identical plastic or wooden building blocks in different colors (yellow, red, green, and blue)
- "cave" made out of a table and a thick blanket



Required materials.



How to set up the experiment:

Lay out all the materials as shown in the photo.

**How to conduct the experiment:**

1. Look closely at the building blocks and their colors.
2. Crawl into the cave and have your team partner hand building blocks to you in the cave one by one. Make sure that no light is coming into the cave.
3. Look at the building blocks and try to identify the colors. Can you do it? Write down your observations when you are outside of the cave again and somebody else is doing the experiment.
4. Now crawl back into the cave with all of your team partners, taking all of the building blocks inside with you.
5. Sort the blocks according to color, one color at each of the four table legs. As a team, decide what color each building block is and then place the block at the corresponding table leg.
6. Open the cave and check the results in the light. How did you do?
7. Darken the cave again and do what a pirate does with an eye patch: Let your eyes get used to the dark. To do so, close your eyes for approximately one minute. Then open them again.
8. First, look at everything in the cave: the floor, your clothing, etc. What was the effect of letting your eyes get used to the dark?
9. Then take another look at the blocks and sort them again by color at each of the table legs. Did you do better this time?

**Write down your observations:**

I notice the following when I look at the colors in the dark:

I notice the following when I let my eyes get used to the dark and then look at my surroundings:

I notice the following when I let my eyes get used to the dark and then look at the different colors:



Evaluate your observations:

1. Fill in the missing words using the appropriate terms in the parentheses.

I can identify the colors _____ (well/poorly) in the dark. It is particularly difficult to distinguish _____ (yellow/blue) and _____ (red/green) from each other.

If you let your eyes get used to the dark, overall you can see _____ (better/worse/equally well) in the dark. After letting my eyes get used to the dark, I can identify the colors _____ (much better/slightly better/worse/just as poorly).

2. Recall the story of Ben and his explanation of why pirates wear eye patches. What do you think? Could this explanation be correct? Write down your guess.

**Doing further research:**

1. Ask your parents if they will let you explore your room in the dark before you go to bed, and make sure that your parents are still awake during your experiment.
2. Turn off the light in your room and shade the windows if light is shining in from outside.
3. Explore your own room in the dark. Can you find your favorite book, your favorite toy, or a particular pen in your room?
Also search through your schoolbag and check whether you have packed everything for the next school day.
4. Tell your parents about your exploration in the dark. What method did you use to find the objects?