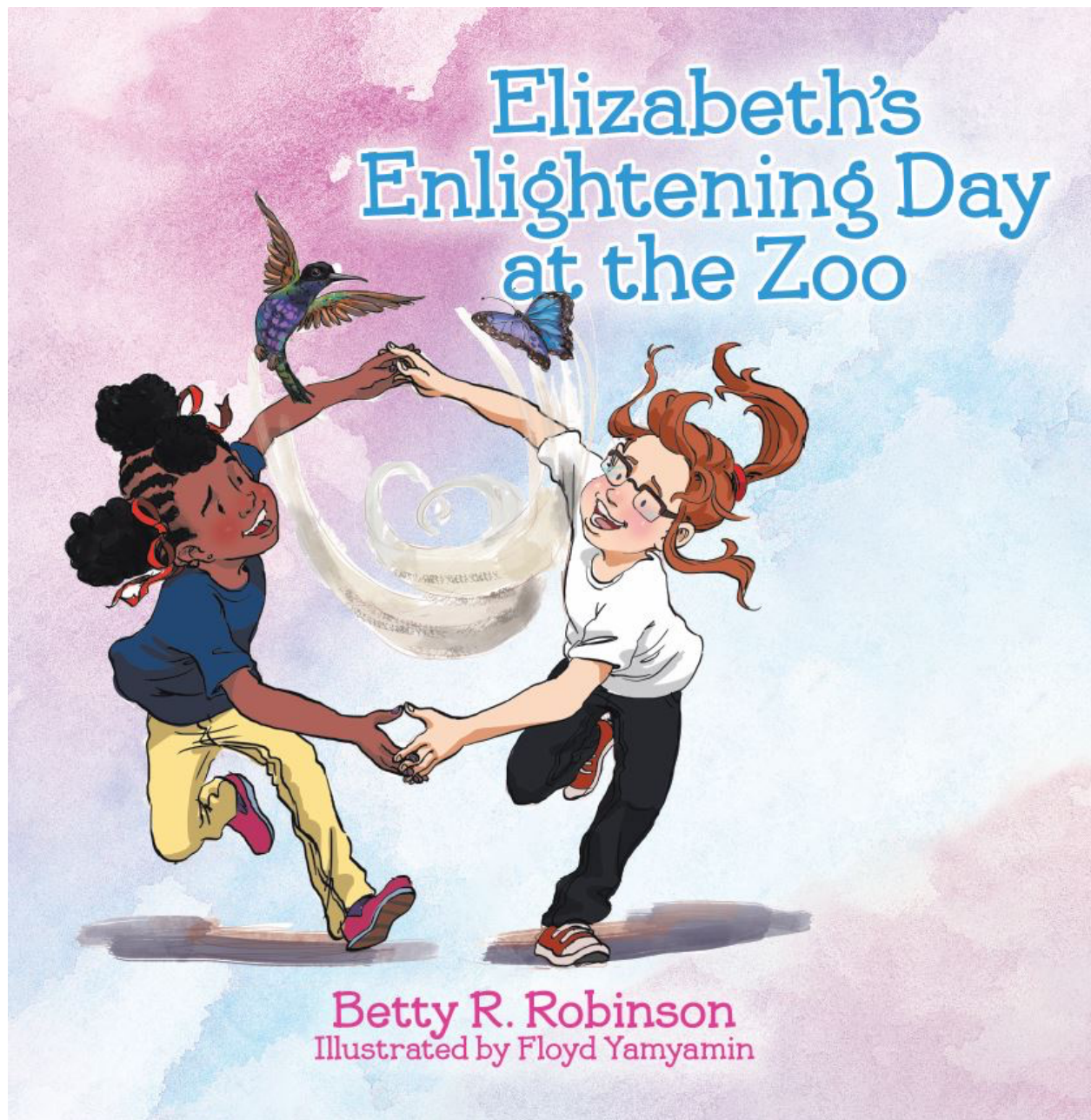




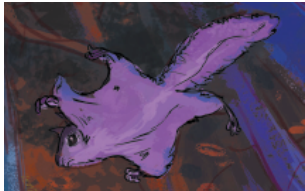
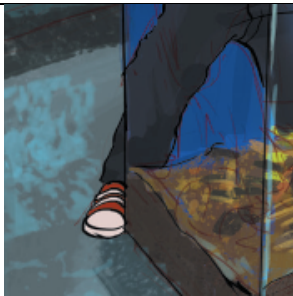

Elizabeth's Enlightening Day at the Zoo
Worksheet with Sample Answers



Elizabeth's Enlightening Day at the Zoo Worksheet



1. Write the property of light being illustrated for each example in the table.

Example	Property of Light
	
	
	
	
	

2. Put the sentences in order to show how a barcode works.
 - a. A decoder within the scanner then reads and stores the data in a computer.
 - b. The reflected light goes back to the scanner.
 - c. The light from the scanner reflects off the barcode.

3. In the story, Dalia is designing a new line of nail polish, inspired by what she sees at the zoo.
 - a. What would you call this new line of zoo-inspired nail polish?

- b. Choose three examples in the book of colours you would like to see as nail polish colours. Name each example.

4. What is a pigment?

5. How does a pigment give a certain colour?

6. What is iridescence?

7. What is an adaptation?

8. What is fluorescence? What type of light makes something fluoresce?

9. What is biofluorescence?

10. How does the iridescence with blue morpho butterfly wings happen?

11. What is laser light? Are lasers always harmful?

12. Describe how the coloration of the blue morpho butterfly wings helps it survive.

13. Describe two ways that UV light helps reindeer survive.

14. Describe how light is used in the alarm system with the penguins in the book.

15. Suppose you could choose a superpower related to light, such as being able to detect more wavelengths than visible light, like reindeer do. What would you choose? Why?



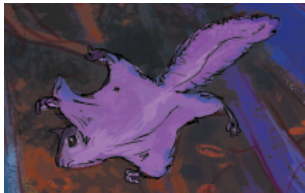


16. Here's a simple activity using materials likely found at home: rock salt (or kosher salt), canola oil, olive oil, and a UV penlight. Put a little of each ingredient in a small bowl. Observe the colours. Turn out the lights and shine a UV light on each. Observe the colours. See video at <https://bettyrobinson.ca/blog/fluorescence-and-colour-models/>



Material	Colour in Daylight	Colour under UV Light
rock salt		
canola oil		
olive oil		

Sample Answers

1.

Example	Property of Light
	Iridescence
	Reflection
	Biofluorescence
	Refraction
	Absorption

2.
 - c. The light from the scanner reflects off the barcode.
 - b. The reflected light goes back to the scanner.
 - a. A decoder within the scanner then reads and stores the data in a computer.
3.
 - a. Wild About You!
 - b. Morpho butterfly: Magnificent Morpho!
Flying squirrel: Tickled Pink
Iridescent peacock: Sparkling Eyes
4. A pigment is a material that gives a certain colour to an object.
5. A pigment absorbs all the colours of light except for the desired colour. For example, a T-shirt could be dyed to look red. The pigment in the dye absorbs all the light except for the red, so we see red.
6. Iridescence is a rainbowlike display of colour caused by refraction as an object moves in light.
7. An adaptation is a feature in animals and insects that helps them survive and reproduce.
8. Fluorescence is the ability of something to glow when exposed to certain light energy. UV light makes something fluoresce. But once you take the light away, the fluorescence stops.
9. Biofluorescence is the ability of a living creature to glow, or fluoresce, when exposed to certain light energy.
10. Butterfly wings are made of tiny scales. When the light hits the wings, the scales refract the light, then the blue is reflected.
11. Laser light is light of one wavelength. Laser light can be dangerous, but not always. When the light used isn't high energy, as in light therapy with Gretta the giraffe, it's not harmful.
12. The brown undersides help the butterflies blend in with their surroundings. The bright blue helps females find the right species to mate with. When the blue morphos are flying, a predator would see alternating blue and brown. This is confusing to the predator, because it can't be sure exactly where the butterfly is, so it can't catch it and eat it.
13. Wolf fur absorbs UV light, so to a reindeer, a wolf looks dark against the snow. This contrast helps reindeer see and avoid the wolves, who eat reindeer. Lichen also absorb UV light, so that makes the plant stand out in the snow. Reindeer eat lichen, so it's easier to find in the snow.
All pee absorbs UV light, so if a reindeer sees a dark spot in the snow, it knows that a wolf (or other predator) may be nearby.

14. The infrared light is on when needed and shines from one side of the gate to the other. On the other side, the light hits a photodetector. If something walks through the gate while the light is on, like the penguins in the book, the photoreceptor notices the sudden change in light level and trips the alarm.
15. I would choose being able to see infrared, so I could see hot and warm spots I wouldn't be able to see normally. This might be helpful trying to find people and pets in the snow, for example.

16.

Material	Colour in Daylight	Colour under UV Light
rock salt	white	pinkish purple
canola oil	yellowish	pale green
olive oil	yellowish green	red