Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Purple Optical Illusions

Day 1:

1. Watch the Laser man video: <https://drive.google.com/file/d/0B43zJVtBSHd4bnV1eW4yZHg2b28/view>

A. How do the lasers move?

B. How does their movement change?

2. Define and draw a picture of the following words (in relation to light).

Transmission:

Reflection:

Refraction:

3. You will need to create a data table. I will display 6 different images and your data table needs to include

Image- Include the number and short description of the image

Vocab- write the word that best describes the image (reflection, refraction or transmission)

Evidence- What evidence can you provide that supports your vocab choice?

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**Day 2:** Watch the What is Light Video <https://drive.google.com/file/d/0B43zJVtBSHd4a1NxZGFrSEZwb2s/view>

A. What is light?

**Lab Activity:**

1. Work on one test at a time.

2. Read over the procedure carefully for each test.

3. Construct a model illustrating your observations for each test. Follow the rubric guidelines below for your models.

Material list

2 clear glasses 2 pennies 1 pitcher/measuring cup 1 dropper

1 pencil Directional arrows

|  |  |  |  |
| --- | --- | --- | --- |
| **Model Rubric Guidelines** | **Points possible** | **Self-Score** | **Teacher score** |
| Label all key features of the system |  |  |  |
| Describe relationships between the parts of the system in depth |  |  |  |
| Explain how light waves behave and move through the system using unit vocabulary and scientific concepts |  |  |  |
| **Group work** | **Points Possible** | **Self-score** | **Teacher score** |
| All members demonstrate respectful, safe and positive behavior |  |  |  |
| The group remains focused and uses class time wisely |  |  |  |
| All members contribute ideas, participate, and divide up lab work evenly |  |  |  |

**Test 1: The Coin Trick**

1. Place a coin on the table and place the first glass on top of the coin.

2. Place the coin inside the second glass.

3. Fill both glasses with equal amounts of water.

4. Look at glasses from many different angles. Record your observations on your model sheet (reference your model rubric) Record in one color

5. Now lift the glass and use the dropper to place a few drops of water on the coin before placing the glass back on top of the coin.

6. Record your observations on your model sheet (reference your model rubric) Record in your second color

7. Annotate your model by answering the question: “What do you believe is the scientific reason for these observations”?

**Test 2: Broken Pencil**

1. Fill one of the glasses halfway with water.

2. Insert a pencil in the glass and water.

3. Hold the pencil straight up in the center of the glass of water and look at the system from the top and the side.

4. Record your observations on your model sheet (reference your model rubric) Record in your first color.

5. Let the pencil rest against the side of the glass at an angle. Look at the pencil from the top and the side.

6. Record your observations on your model sheet (reference your model rubric) Record in your second color.

7. Hold the pencil straight up in the glass, but to the left of the center. Look at the pencil from the top and the side.

8. Record your observations on your model sheet (reference your model rubric) Record in a third color.

9. Annotate your model by answering the question: “What do you believe is the scientific reason for these observations

**Test 3: Directional arrows**

1. Stand the arrow sheet up behind one empty, clear glass.

2. Begin to fill the glass a little past the first arrow only.

3. Record your observations on your model sheet (reference your model rubric) Record in your first color.

4. Fill the glass past the second arrow.

5. Record your observations on your model sheet (reference your model rubric) Record in your second color.

6. Slide the glass side to side, to the left and right of the arrows.

7. Record your observations on your model sheet (reference your model rubric) Record in your second color. Use your third color

8. Annotate your model by answering the following questions; “What do you believe is the scientific reason for these observations?”

**Test 4- Watery stripes**

1. Stand the stripe sheet up behind one empty, clear glass.

2. Fill the glass halfway with water

3. Record your observations on your model sheet (reference your model rubric) Record in your first color.

4. Fill the glass with water.

5. Record your observations on your model sheet (reference your model rubric) Record in your second color.

6. Slide the glass side to side.

7. Record your observations on your model sheet (reference your model rubric) Record in your third color.

8. Annotate your model by answering the following questions; “What do you believe is the scientific reason for these observations?”

Model Sheet

Test 1

Test 2

Model Sheet

Test 3

Test 4

**Purple**

**Analysis and Conclusions:**

1. Examine the results of all four tests. As light travels through the glass, the water, and through the air to your eyes, what did you observe happening to the light waves in each of the tests?

Test 1:

Test 2:

Test 3:

Test 4:

2. Write a conclusion that explains what you have learned about the behavior of light as it passes from one medium to another. (5-7 sentences and include one pieces of evidence)