

VISUAL PERCEPTION

Read the background information at each station and complete the activity. Collect data and answer questions on the sheet below.

ACTIVITY 1: Visual Acuity

1. Visual Acuity, right eye: 20/ 15
2. Visual Acuity, left eye: 20/ 15-1

3. Your friend swears that no one can possibly have better than 20/20 vision. Use what you have learned about the Snellen eye examination chart and what numbers such as 20/20 really mean to set him/her straight.

What a normal person can see clearly at 15 feet, you can see at 20

ACTIVITY 2: Astigmatism and Blind Spot

1. Is astigmatism present in your right eye? Yes
2. Is astigmatism present in your left eye? Yes
3. If yes, were you aware of the astigmatism before today? No
4. If yes, do you wear glasses to correct the astigmatism? No
5. At what distance did the dot disappear during the blind spot test for the right eye? 23 cm
6. At what distance did the dot disappear during the blind spot test for the left eye? 21 cm
7. Explain what is happening in the eye to cause astigmatism. How does this impact how you see?  
The cornea or lens is irregularly shaped, makes images blurry

8. List at least two circumstances in which it would be important to be aware of your blind spots.

Driving, sports

ACTIVITY 3: Visual Mapping

1. What is the diameter of the fovea centralis? 8 mm
2. How does the size of the fovea centralis of your eye compare to that of others in your group?  
Bigger
3. Explain the importance of the fovea centralis to your 9-year-old sister.  
This is the spot in your eye where you can see best

**ACTIVITY 4: Color Vision**

1. Were any of the strands of yarn difficult to match? Yes If yes, list the colors that were difficult to match.  
Yellow, Green
2. To your knowledge, are you color perception deficient? No
3. Is anyone in your family color perception deficient? No If yes, who?
4. Given that the previous question asks about family members and color perception deficiency, what can you infer about the development of this condition? It's hereditary
5. Some cities hang their traffic lights from left to right, rather than from top to bottom. Explain why this might cause a problem for a driver with red-green perception deficiency.  
They couldn't tell which color was lit up
6. Explain the specific roles of rods and cones in the eye.  

↓                  ↓

black            color

↓                  ↓

white            vision

↓                  ↓

vision
7. If we have three different types of cones – red cones, blue cones, and green cones – how do we see such a wide range of colors?  
The mixture of those 3 colors makes all the others

**ACTIVITY 5: Depth Perception**

? 1. Record the distance between the arrows on the depth perception tester for each scenario given in the chart

	No Background	White Background	Black Background
Right Eye Open	2 cm	0 cm	0 cm
Left Eye Open	2 cm	0 cm	0 cm
Both Eyes Open	0 cm	0 cm	0 cm

2. Which background provided you with the best depth perception? Why do you think this is the case?  
Black?
3. List several careers or activities in which depth perception plays an important role.  
Catching a ball, looking at oncoming traffic, Professional basketball player
4. Why might driving be dangerous for someone with poor depth perception?  
He/She wouldn't be able to stop in time

### ACTIVITY 6: Accommodation

1. When looking at the "E" on your finger, was the "E" on the chart blurry or in focus?

Blurry

2. When looking at the "E" on the chart, was the "E" on your finger blurry or in focus?

Blurry

3. What happened when you closed and opened your right eye?

It got clearer

4. What happened when you closed and opened your left eye?

||

5. Judging from your results, do you think you are emmetropic, myopic, or hyperopic? Explain.

Emmetropic because both objects were mostly clear

6. What is accommodation in the eye? How are muscles involved in this process?

↓  
Combination of reflex actions

↓  
Ciliary muscles contract and relax

### ACTIVITY 7: Near Point (OPTIONAL)

1. Near point, left eye  $\frac{8}{12}$  cm

Near Point, right eye  $\frac{8\frac{1}{2}}{13}$  cm

2. As you age, your near point will change. Do you think it will increase or decrease? Why?

Decrease, because older people tend to have more vision problems with reading

3. Why is the near point closer for a myopic person than that of a hyperopic person?

Their lens have changed to see close up better

4. List several activities during which the near point is important.

Reading, microscope

### ACTIVITY 8: Peripheral Vision

1. Out of 20, how many cards from the black/white set were identified correctly? 20

2. Out of 20, how many cards from the colored set were identified correctly? 14

3. Which did you see better using your peripheral vision: black and white or color?

Black and white

4. Using rods and cones in your answer, explain your answer to Question 3.

More rods make up peripheral vision

5. List some situations where you would most likely rely on your peripheral vision.

Driving & playing sports

### ACTIVITY 9: Afterimages

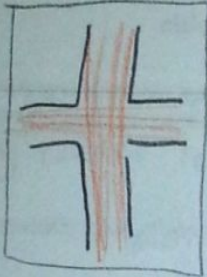
1. What afterimage did you see after looking at the red vinyl? What afterimage did you see after looking at the green vinyl?

Yellow, Lavender

2. Explain what happens in the eye to cause an afterimage.

Cones become fatigued

3. In the space below, draw in color the afterimage of one of the King cards from the deck of illusion cards. Why did you see the images in the colors that you saw?



### ACTIVITY 10: Illusions

1. For each of the Jacks, explain why the image that you see is impossible.

Hearts: Looks as if the stairs go down (or up) forever

Diamonds: It turns differently

Clubs: Middle peg isn't really there

Spades: Triangle can't be facing 3 directions at once

2. The Diamonds cards 2-10 involve perception. Look at the 3 of Diamonds card. All three figures are the same height. Explain how the illusion of varying heights is created.

More lines on the wall make him look further away

3. The Clubs cards 2-10 test your ability to judge sizes and shapes. Look at the 9 of Clubs card. Although the two center circles are the same size, the one surrounded by smaller circles appears much larger. Why do you think this occurs?

Size of dots make the middle one look smaller or larger in relation

4. The Spades cards 2-10 illustrate illusions of movement and the perception of movement. Look at the Spades cards 4 and 5. Place the cards side by side. Describe what you see.

They look like they're spinning

Now move one of the cards while keeping the other card still. What do you see? Explain your findings.

One looks like it's spinning in the opposite direction

Now, move the cards in the opposite directions. What do you see?

They look like they're spinning away from each other