REFLECTION WITH REFLECT VIEW

Reflections are everywhere. When you look at yourself in the mirror, or in a big window, you're observing the wonder of reflection! So how do reflections work? Do they have rules?

Big Idea

Demonstrate the concept of reflection and the formation of virtual images by drawing mirror images with the Reflect View.

What You'll Need

- 1 Reflect View
- 1 Lazr finger
- A ruler
- A mirror

Reflection

Light travels in straight lines. It moves freely through the open air, but when it comes across an obstacle, it can't move around it. So what does it do?

A lot of the time, the light bounces off the object. This is called reflection, and it's how we see! Take a look at Figure 1. When light from the sun or your overhead light bounces off an object and into your eye, your eye "sees" the object. Have you ever been in a room so dark you can't see your own hand in front of your face? This is because without light, your eye can't tell an object is there!

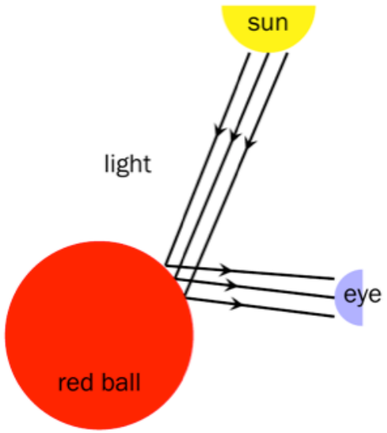

Figure 1: How We See

When light from an object bounces off a reflective surface like a mirror or a window, you see the object on the other side of the glass. This reflection is called a virtual image. Virtual means fake or appearing to be real. This is because the object is not really there - when you look in a mirror, the reflection makes it look like you're standing in front of yourself, but you're not really there!

Virtual Images

The virtual images created by a flat mirror or piece of glass follow some very strict rules, as shown in Figure 2. Take a look at yourself in the mirror. Notice how far from the mirror you're standing. How far does your reflection seem to be standing from the mirror, on the other side?

You should notice that your reflection is the same distance from the mirror as you are! This is because a virtual image is always the same distance from a flat mirror as the real object. Your virtual image is also the same size as you are.

Now lift your left hand, and wave at yourself. Which hand is your reflection waving with? You'll see your reflection is waving with its right hand. The virtual image is inverted, or swapped around - left becomes right!

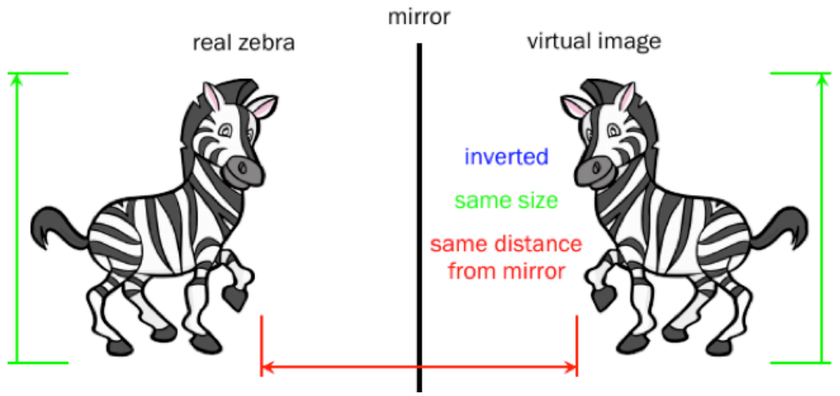

Figure 2: Properties of a Virtual Image

Virtual Images in Real Life: Ambulances

Emergency vehicles like ambulances tend to have AMBULANCE written clearly on the front of the vehicle. However, it's often written backwards!

When an ambulance is trying to make its way through traffic, it sounds its sirens. If you're a driver in front of the ambulance, you'll look back in your rear view mirror to see what the sirens are about. The virtual image of the ambulance will be backwards, however. If the word "ambulance" is backwards to begin with, the mirror will swap it the right way around, and the driver will know to move out of the way for the ambulance!

ACTIVITY SHEET

Reflection with Reflect View

We're going to use the Reflect View to reflect pictures and words, and see for ourselves how virtual images work!

1. Write your name in the blank slot on the worksheet.
2. Place the Reflect View on the dotted line. Make sure the stand is facing upwards and the bevelled (stepped) edge is towards to.
3. Lean slightly to the left, until the star on the right matches up with the reflection of the one of the left.
4. Reach your arm around to the right hand side and trace the reflections you see on the Reflect View onto the paper.

What do you notice about the words/images on the right hand side? Measure the distance between each matching word or picture and the dotted line. What does this tell us about virtual images?

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The words/images on the right hand side are the same size as those on the left, but they are inverted. They are also the same distance from the dotted line as those on the left.

5. Fold the paper in half along the dotted line. Holding the folded paper up, shine the light of the Lazr finger against the back of the paper, towards you. You should see both halves of the paper at once now.

What do you notice about the words/images on both halves? Do they match up? Don't they?

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The words/images match up. This confirms what we learnt above about virtual images formed by flat mirrors!

6. Unfold the paper and stand in front of the mirror, holding the paper in front of you. Observe the worksheet's reflection in the mirror.

What do you notice about the words on the right hand side/traced side?

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In the mirror, the words on the right hand side are the right way around, and those on the left are backwards. The reflection of the right hand side is inverted, so it has turned it the right way around again!

ACTIVITY SHEET

Reflection with Reflect View

Hello!

My name is

_____

Draw your own picture in the box!