Emitting vs. Reflecting Light
YouTube Video: What is Reflection of Light?

https://www.youtube.com/watch?v=9PRRUgoTSro
• **Emit** means to give off or produce.
  – For example: this flashlight is giving off or *emitting* light.

What else **emits** light?

https://www.wired.com/story/led-flashlights-are-bright-but-just-how-bright-exactly/
Reflect Light

• Reflect means to give, send, or bounce back.
  – For example: the tree is reflecting the light being emitted by the Sun into our eyes which allows us to see it.

What else reflects light?
Why can’t we see light travel?

It travels too fast!

The Speed of Light = 299,792 km / s

- That’s almost 300,000 kilometers per second!
If we could travel that fast...

If we could travel at 300,000 km/s:

• We could go all the way around the Earth 7.5 times in 1 second!

That’s incredibly fast!
From the Sun to the Earth

How long do you think it takes light emitted by the Sun to reach the Earth?

- The Sun is about 149,000,000 km away from Earth.
- Light travels at about 300,000 km/s.

Make a prediction!
Show me the Math!

\[
\frac{149,000,000 \text{ km (distance from Sun to Earth)}}{300,000 \text{ km/s (speed of light)}} = 497 \text{ seconds}
\]

How many minutes is that?
Show me the Math!

497 seconds
÷
60
(# seconds in a minute)

= 8.3 minutes
(8 minutes and 19 seconds)
## Emit vs. Reflect Activity

<table>
<thead>
<tr>
<th>Inside the Classroom</th>
<th>Outside of the Classroom</th>
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</thead>
<tbody>
<tr>
<td>Emits</td>
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<tr>
<td>Roof Lights</td>
<td>Street Lamp</td>
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<tr>
<td>Mr. Harney</td>
<td>Houses</td>
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<tr>
<td>Laptop</td>
<td>Flashlight</td>
</tr>
<tr>
<td>Students!</td>
<td>Saddledome</td>
</tr>
<tr>
<td>Cellphone</td>
<td>Open Sign</td>
</tr>
<tr>
<td>Desks</td>
<td>Trees</td>
</tr>
</tbody>
</table>

Share your answers!
Objects in Space

T - Chart

Please take a T - Chart and fill it in as we go through the different objects in space!
Objects in Space that Emit Light
Objects in Space

**Emit Light**

Sun:

The star that is the central body of the solar system, around which the planets revolve and from which they receive light and heat.

http://nautil.us/blog/what-is-the-sun-made-of-and-when-will-it-die
**Objects in Space**

**Emit Light**

**Stars:**

A star is a large ball of burning gas in space. Stars appear to us as small points of light in the sky on clear nights.

https://earthsky.org/brightest-stars/sirius-the-brightest-star
Galaxies:

A galaxy is a huge collection of gas, dust, stars and their solar systems. A galaxy is held together by gravity. Our galaxy is called the Milky Way.

https://spaceplace.nasa.gov/galaxy/en/
Objects in Space

**Meteors:**

A meteor is the flash of light that we see in the night sky when a small chunk of rock burns up as it passes through our atmosphere (Shooting Stars!)

https://www.hindustantimes.com/science/away-from-city-lights-sky-gazers-can-see-geminid-meteor-shower-tomorrow-night/story-D0efXT1go2URYQDYWaUEL.html
## Objects in Space

### Emit Light

**Nebula:**

A giant cloud of dust and gas in space. Some come from the gas and dust thrown out by the explosion of a dying star.

https://earthsky.org/clusters-nebulae-galaxies/orion-nebula-jewel-in-orions-sword
Objects in Space that Reflect Light
Objects in Space

Reflect Light

Planets:
A celestial body moving in an elliptical orbit around a star.

What kind of shape is an ellipse?

https://www.skyandtelescope.com/observing/see-all-eight-planets-in-one-night/
<table>
<thead>
<tr>
<th>Reflect Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moons:</td>
</tr>
<tr>
<td>The natural satellite of the Earth, visible by reflected light from the Sun.</td>
</tr>
</tbody>
</table>
Objects in Space

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<tr>
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<tr>
<td><strong>Comets:</strong></td>
</tr>
<tr>
<td>A celestial object with a core of ice and dust. When near the Sun, a “tail” of gas and dust can be seen.</td>
</tr>
</tbody>
</table>

https://space-facts.com/comets/
## Reflect Light

<table>
<thead>
<tr>
<th>Meteoroids:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A small rocky body moving in the solar system that would become a meteor if it entered the earth's atmosphere.</td>
</tr>
</tbody>
</table>

Objects in Space

Asteroids:
Large, rocky objects that orbit the Sun. Most of them live in the main asteroid belt (between the orbits of Mars and Jupiter). They are much smaller than planets.

https://spaceplace.nasa.gov/asteroid/en/
## Objects in Space

### Check your T-Chart!

<table>
<thead>
<tr>
<th>Emit Light</th>
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<tbody>
<tr>
<td>Sun</td>
<td>Planets</td>
</tr>
<tr>
<td>Stars</td>
<td>Moons</td>
</tr>
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<td>Galaxies</td>
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Before we finish...

1) Put your “Emit vs. Reflect Activity” and “Objects in Space that” sheets in your Sky Science Toolkit!

2) Grab a pencil and fill out your Exit Card.

3) Once you have finished your Exit Card place it in the Hand-in Bin.
Next Class

- Please bring an empty cereal box!

- On Wednesday we will be building an exciting tool to view the Sun!
  - There might just be a special gift for those who bring one in...