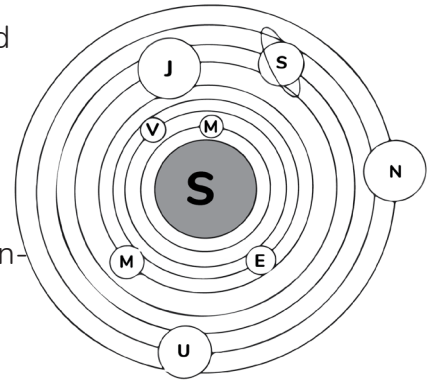Date: _____   Name: _____

Planets in Our Solar System

This activity was created by Sophia & Victoria.

Do you know all of the planets in our solar system?

There's Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. But that's pretty hard to remember.

> Here's a fun way to remember the planets order!
> **M**y **V**ery **E**xcellent **M**other **J**ust **S**erved **U**s **N**achos

Now you might be thinking, what does this have to do with planets? Now I'm just hungry!

But if you look at the bold letters (MVEMJSUN), the letters that start the words are also the letters that start the names of the planets in our solar system from closest to the sun to furthest!

How big are the planets in our solar system?

Do you know what the biggest and smallest planets in our solar system are?

Let's put this in perspective, and use some fruit to compare their relative sizes:
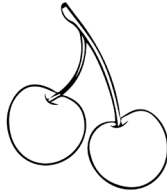
First let's pretend that Earth was the size of a cherry.

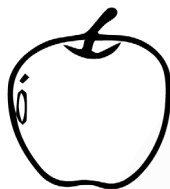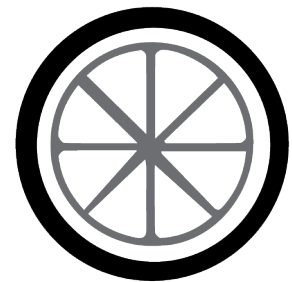If it was, Mercury would be the size of a tiny little peppercorn.

Venus would be the size of a large blueberry.

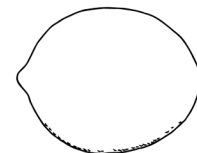Mars would be the size of a pea.

Jupiter would be the size of a watermelon.

Saturn would be the size of a large grapefruit.

Uranus would be the size of an apple.

And Neptune would be the size of a lemon.

This activity continues on the next page!

How far apart are the planets in our solar system?

See if you can find one of each of those food items, or something of similar size, grab a piece of sidewalk chalk and head outside!

The planets in our solar system are not very close together. In fact, there is even a way to compare the distance of the planets to the sun. It's called "Astronomical Units" or AU for short. One AU is equal the distance between the earth and the sun, and is equal to 150 million kilometers (150,000,000km).

We will be using the actual distances to approximate how far apart our fruits and veggies should be apart.

These are the real values on how far apart they are:

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Distance from the Sun	0.38 AU	0.72 AU	1.00 AU	1.52 AU	5.20 AU	9.58 AU	19.12 AU	30.20 AU

For this activity we approximated by leaving the decimals as they are. If you want to make a more accurate scale try moving the decimal to the right. Get ready to take 302 steps to get to Neptune! (The steps would be 4, 3, 3, 5, 37, 59, 95, 207 and then 302)

We are going to do this on a smaller scale here. First, grab your chalk and draw a circle on the road or sidewalk outside. This is going to be your sun! Make you sure you have lots of room and ask someone to be your astronaut to look out for any bikes, people or cars!

- First, take 1/2 of a step away from your circle/sun and place your peppercorn. This is Mercury!

- Next, take 1/4 of a step forward from your peppercorn (Mercury) and place your blueberry. This is Venus!

- Now, take another 1/4 of a step from your blueberry, and place your cherry. This is us! Earth!
  * *Note that even though you are only 1/4 of a step away from 'Mercury' you are a full step away from the sun! Which compares to the 1 AU the Earth is from the sun.*

- Next is 1 full step from the cherry, place the pea. You've made it to Mars!

- Then take 3 steps to Jupiter, and place the watermelon.

- 5 steps to Saturn, place the grapefruit.

- 9 steps and you've arrived at Uranus, place the apple here.

- And last but not least, 11 steps and you've reached Neptune, put your lime here!

Congrats space Explorer! You've made your very own solar system!
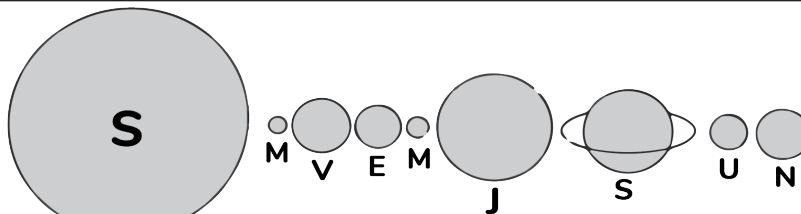
**How much do I weigh on other planets in our solar system?**

Every planet in our solar system has a different amount of gravity, which means you would have a different weight on each planet. One very important thing to understand is there is a difference between weight and mass. Your weight changes depending on the amount of gravity there is, but the amount of mass remains the same. This is because mass is a measure of the amount of matter, and your matter we are made of does not change with gravity (meaning you will remain the same size regardless of the amount of gravity). Gravity is also that mysterious force that makes everything fall to the ground rather than floating upwards when you drop it. In space there is no gravity and that is why things float around when they are dropped.

To figure out how much you would weigh on other planets you must first figure out your weight in kilograms. Most people know their weight in pounds. It is easy to switch between them, all you have to do is divide your weight in pounds by 2.2 .

> Yay! It's time for math! Math is a super important part of coding. So let me help! For example I weigh 110 pounds (on earth), so...
>
> 110/2.2 = 50 kg
>
> So my mass is 50 kg!
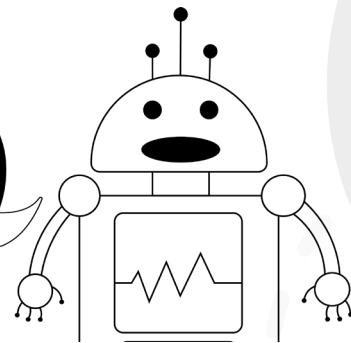
What is your mass ? _____ kg

Now to figure out your weight on other planets you have to multiply your mass by the amount of gravity, which is measured by its gravitational constant (G_c), which compares the amount of gravity on other planets to the amount of gravity on earth. Meaning earth's gravity is $1G_c$.

So the equations is   **Weight = mass × gravity**

And here is the amount of gravity on other planets :

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Gravity (G_c)	0.38	0.91	1.0	0.38	2.34	0.93	0.92	1.12
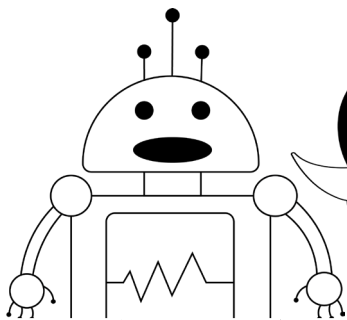
> More math! Yippee! So if my mass is 50kg and the gravity on Mercury is $0.38G_c$ then my weight on Mercury is:
>
> 50 x 0.38 = 19kg
>
> Can you calculate your weight on all of the different planets?

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Gravity (G_c)	0.38	0.91	1.0	0.38	2.34	0.93	0.92	1.12
Your Weight								