

SEPTEMBER WEEK 3

Black Holes, At Home!

by STEM Powering

September 26th is National Astronomy Day, and September 21st to 27th is National Astronomy Week! Let's explore one of the great mysteries of space - the black hole! Just recently, astrophysicists have photographed a black hole for the first time! But how do they work?

A black hole is a region of space with such a high density, that it's gravitational pull on other objects is so strong, not even light can escape once it's sucked in! When a gigantic star in space runs out of energy, it collapses in on itself to form the extremely dense centre, called a singularity. Anything within a certain distance from this singularity, will not escape its pull.

A black hole emits no light, so how do we see it? We actually will only see the effects on its surroundings! When astrophysicists photographed the black hole, they were able to see the event horizon of the black hole, the region of space surrounding the singularity where stars disintegrate, and interstellar objects are broken apart due to its immense gravitational force. Let's model the motion of a black hole!

Materials List:

Large stretchy piece of fabric or sheet

Small marble

Larger, heavier ball or object

2 friends!



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Procedure:

1. Have 2 friends stretch out the fabric and keep it taut. This represents the fabric of space-time in which the black hole sits.
2. Place the larger, heavier object in the middle of the fabric. This represents the singularity of the black hole.
3. Lightly toss the small marble around the fabric. Observe the path of the marble!

The Science Behind this Experiment:

You've probably noticed that the marble passes in a circular pattern around the large object in the center, and eventually travels to the centre with the large object. Notice that the marble cannot move away from the centre, and once it reaches there, it's stuck! This is similar to the path of an interstellar object hurtling towards the black hole!

