GRAVITY
gravity

"THE SHIT THAT KEEPS US ON THE GROUND."

NEWTON'S LAWS OF MOTION

1 AN OBJECT AT REST TENDS TO STAY AT REST, AND AN OBJECT IN MOTION TENDS TO STAY IN MOTION UNLESS ACTED UPON BY AN OUTSIDE FORCE. THIS RELATES TO INERTIA.

2 THE ACCELERATION OF A BODY DUE TO A FORCE WILL BE IN THE SAME DIRECTION AS THE FORCE AND INVERSELY PROPORTIONAL TO MASS. $F=MA$.

3 FOR EVERY ACTION, THERE IS AN EQUAL AND OPPOSITE REACTION.

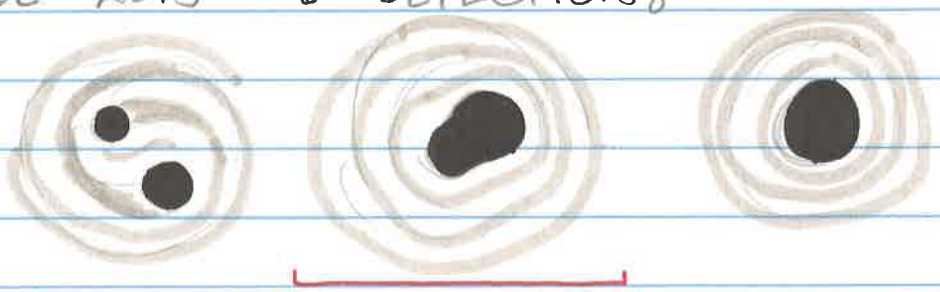
LAW OF GRAVITATION

$$F_g = \frac{G m_1 m_2}{r^2}$$

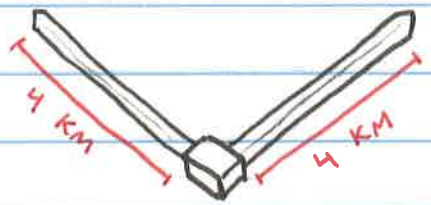
- F_g: FORCE OF GRAVITY
- G: GRAVITATIONAL CONSTANT
- m_1: OBJECT 1 MASS
- m_2: OBJECT 2 MASS
- r^2: DISTANCE BETWEEN THE TWO OBJECT'S CENTERS

GRAVITATIONAL WAVES

- WE'VE BEEN LOOKING FOR GRAVITATIONAL WAVES AS THE RESULT OF MERGING TWO "COMPACT OBJECTS"
- BEFORE 2015 - NOTHING
- SINCE 2015 - 6 DETECTIONS



- GRAVITATONAL WAVES CREATE VERY SLIGHT MOVEMENT
- THERE ARE TWO DETECTION TOOLS IN WASHNGTON AND LOUISANA



PRACTICE QUESTIONS

Q: IF YOU STEP OFF A 250 FT LADDER, WHAT HAPPENS?

A: YOU'D FALL BACK TO EARTH. IF YOU WANTED TO ORBIT, YOU'D NEED A HORIZONTAL VELOCITY

Q: ACCORDING TO NEWTONS 2ND LAW OF MOTION, IF NET FORCE INCREASES WHILE MASS REMAINS CONSTANT, WHAT HAPPENS TO ACCELERATION?

A: ACCELERATION INCREASES.

Q: IF THE EARTH WERE MOVED TO HALF ITS CURRENT DISTANCE FROM THE SUN, HOW WOULD GRAVITY CHANGE?

A: IT WOULD BE 4 TIMES STRONGER

Q: WHAT DID NEWTON'S LAW OF UNIVERSAL GRAVITATION TELL US ABOUT HOW GRAVITY WORKS?

A: THE FORCE OF GRAVITY FROM THE SUN WILL BE STRONGER ON AN OBJECT WITH MORE MASS.

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Q: THE EARTH'S RADIUS IS ABOUT 6400KM. IF YOU'RE IN A SPACE STATION IN ORBIT 1500KM ABOVE EARTH, THE FORCE OF GRAVITY YOU'D FEEL FROM EARTH WOULD BE:

A: SLIGHTLY WEAKER THAN IF YOU WERE STANDING ON EARTH

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Q: IF YOU WERE SITING ON THE EARTH, THE FORCE OF GRAVITY IS PULLING YOU TOWARDS EARTH. WHAT IS TRUE DUE TO NEWTON'S THIRD LAW?

A: YOU ARE PUSHING THE EARTH AWAY WITH THE SAME FORCE.