

IN YOUR NOTES...

Respond to the following:

How did the moon get there?

## CAPTURE THEORY

Capture- A large object wandered into our **early** solar system and was captured in the Earth's gravitational field.

- Problems: What could slow the object down enough for the **Earth** to grab on to it? Why does the Moon have a similar composition?

## FISSION THEORY

That the Earth was spinning so quickly that a bulge formed and was thrown off to form the moon.

- Problem – no evidence that the Earth was ever spinning that fast. If it were, why did the moon form where it is; not further away?

## CO-ACCRETION OR SIMULTANEOUS FORMATION

Simultaneous **Formation**- The Moon and Earth formed at the same time.

- Problems: The Earth is **iron** rich and the Moon isn't.
- The moon is younger than the Earth.

# IMPACT THEORY

- **The Impact Theory** of the moon's formation
- Earth's moon formed from a collision between the early Earth and a Mars-sized object

**Most accepted theory  
today!**

# EVIDENCE

- Contain similar rocks
  - Moon rocks lack water – evaporated in space as a result of high temperatures during impact.
  - Density of the moon is lower than Earth's ( moon is made of crust and mantle material)
  - Moon - small iron core
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# THEORIES FOR FORMATION OF THE MOON

## IMPACT THEORY

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# OTHER THEORIES

Of Lunar Formation



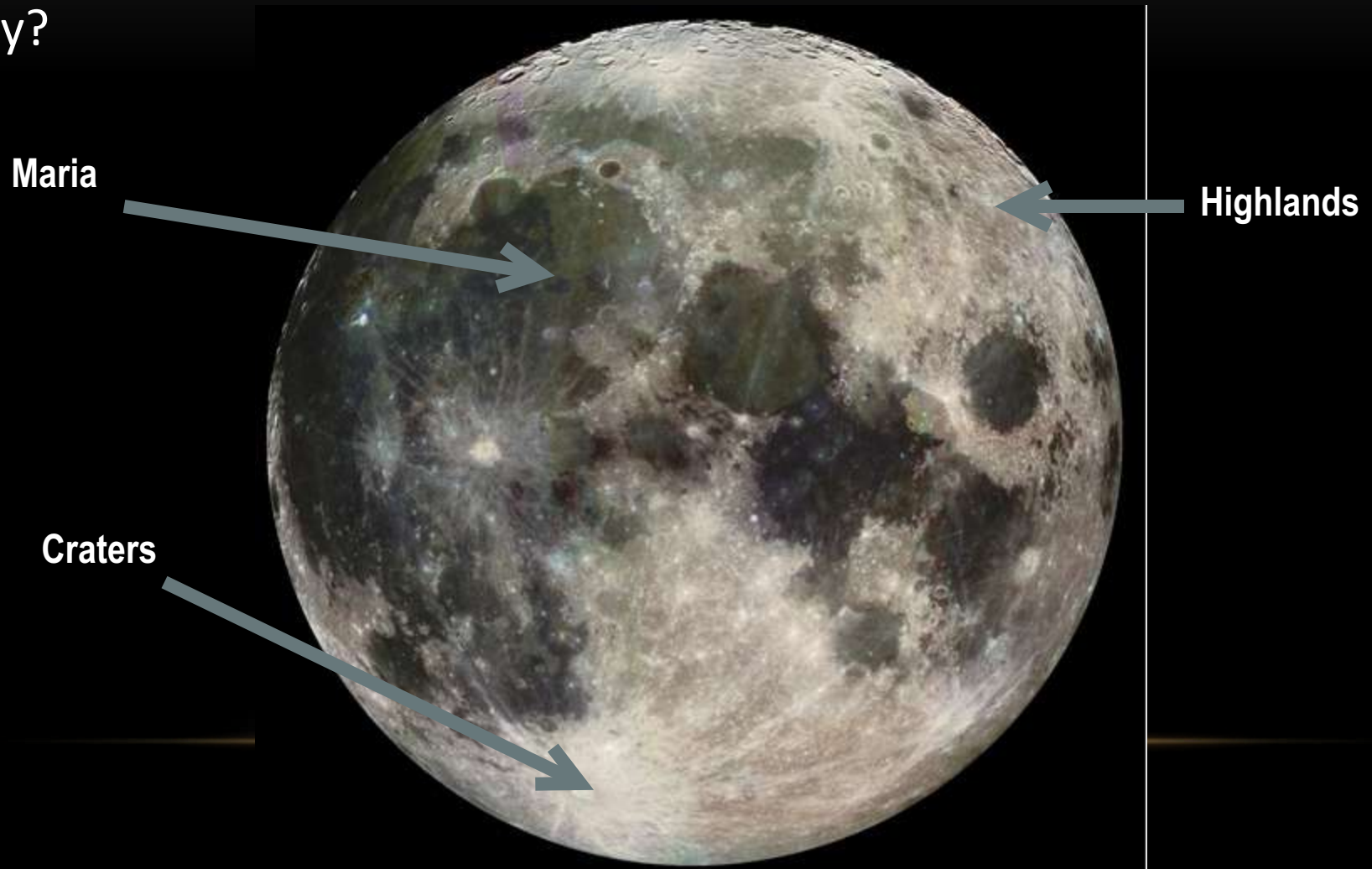
## MOONLET CONDENSATION THEORY

- Earth struck by many comets/asteroids in early solar system formation
  - Ejected material formed rings around the Earth each time
  - Rings condensed into moonlets
  - Moonlets eventually collided/merged with each other
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# EVIDENCE

- Contain similar rocks
  - Moon rocks lack water – evaporated in space as a result of high temperatures during impact.
  - Density of the moon is lower than Earth's ( moon is made of crust and mantle material)
  - Moon - small iron core
  - NO evidence of the “Impact Theory” impactor found
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1. What are some major observations/noticeable features of the moon?
2. What do you believe some of these features may be or be caused by?



# EARTH'S MOON

## Features

- 3,475 km (2,150 miles) in diameter  
(1/4 of Earth's)

Similar to Earth's mantle rocks  
(crust)

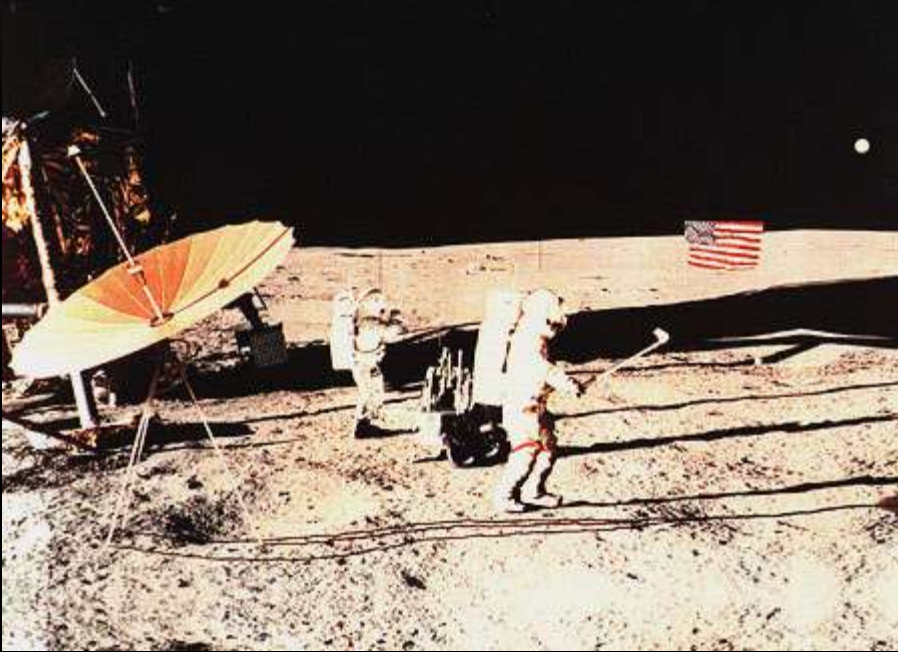
**Revolution 27 days, 8 hours**

**Rotation 27 days, 7.2 hours**

So, the same side of the  
moon is always facing us!

Measurement	Earth	Moon
Mean diameter	12,742 km	3,476 km
Volume	$1.08321 \times 10^{12} \text{ km}^3$	$2.199 \times 10^{10} \text{ km}^3$
Mass	$5.9736 \times 10^{24} \text{ kg}$	$7.349 \times 10^{22} \text{ kg}$
Mean density	5.515	3.342
Surface gravity	9.78 m/s <sup>2</sup>	1.62 m/s <sup>2</sup>
Escape velocity	11.2 km/s	2.38 km/s
Visual albedo	0.367	0.12
Visual magnitude	-3.86	+0.21

- **Apollo 14**  
Golf



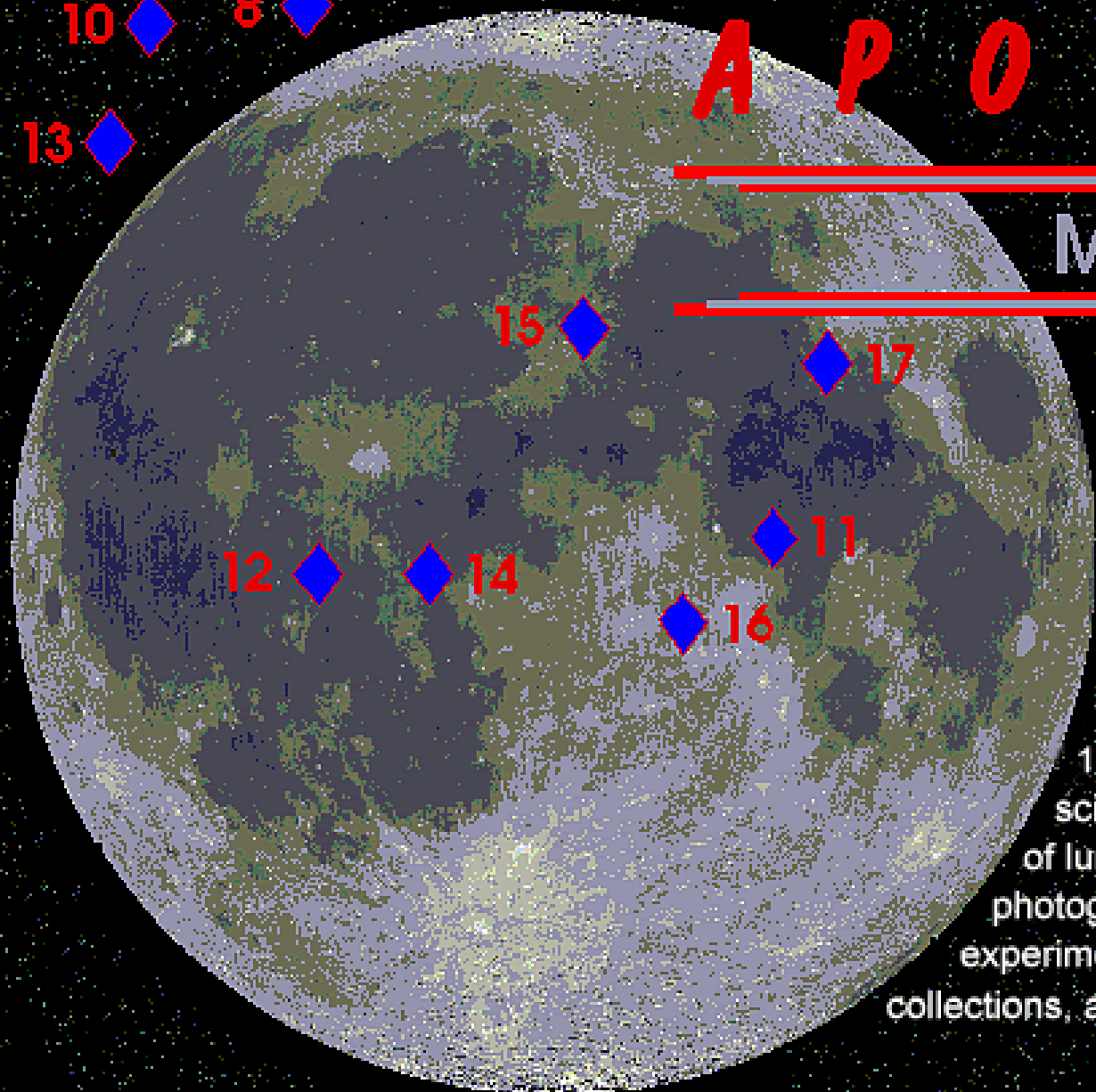
**APOLLO 15**  
FEATHER AND  
HAMMER



10 ♦ 8 ♦  
13 ♦

# A P O L L O

## MISSIONS



The six Apollo landings, which took place between 1969 and 1972, provided scientists with huge amounts of lunar data in the form of photography, surface and orbital experiment results, sample collections, and surface operations.

# CARTOON

- Create a cartoon of 3 or more frames which depicts the theory of moon formation you most agree with.
  - Give a written description of what is happening in each slide.
  - Discuss why you chose this theory of moon formation.
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