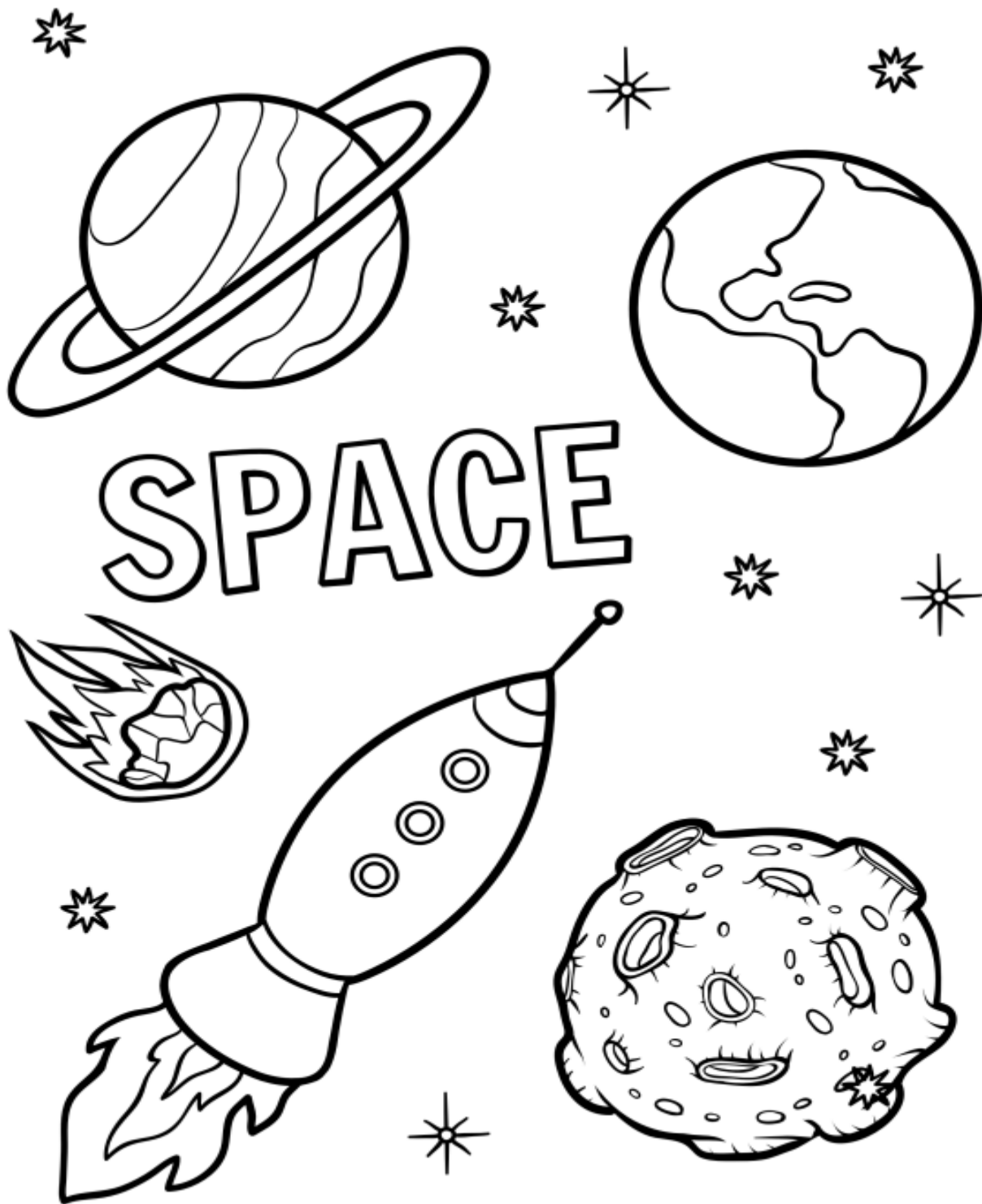


Asteroids, Comets, and Meteorites!



Impact Craters Experiment Directions

Drop balls in flour and cocoa powder. This is an experiment about impacts from meteoroids, asteroids, and comets!

Materials:

- Flour (provided)
- Cocoa powder (provided)
- Bowl (provided)
- Sieve or sifter (optional)
- Balls/marbles/rocks of various sizes (one bouncy ball provided)
- Asteroids, Comets, and Meteorites packet (provided)

Procedure:


Lay down newspaper or do this experiment outside...it could get messy!

1. Fill the bowl with flour.
2. Sprinkle a thin layer of cocoa powder on top of the flour.
3. Try dropping a ball from about a foot above.
4. Carefully remove the ball and observe the impact crater.



Impact Craters Experiment Observations

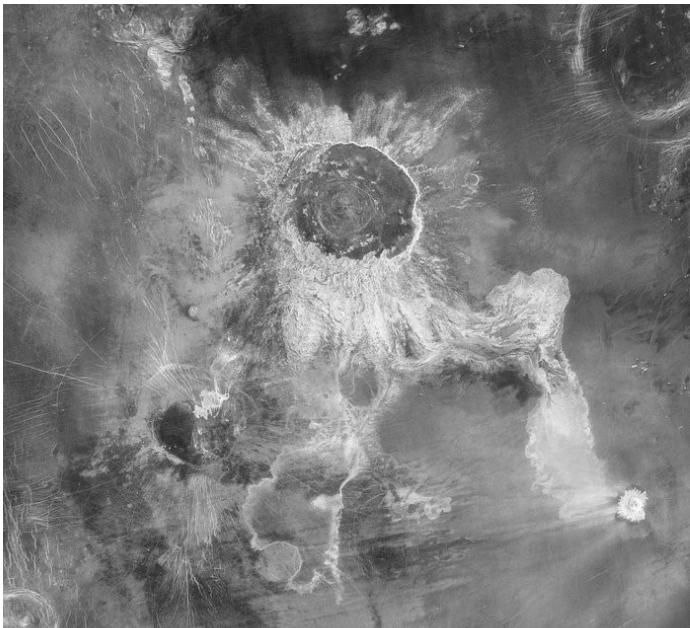
Draw a picture of your craters:



1. What happens if you change the size of your “meteorite”? (For example, a marble vs. a rock)
2. What happens if you change the height drop of your “meteorite”? (For example, dropping your “meteorite” from shoulder height vs. above your head)
3. What happens if the “meteorite” is dropped at an angle?
4. What do you notice about the flour and the cocoa powder at the point of impact?

What Happened?

- An impact crater is formed when a celestial body hits Earth's surface. What the crater looks like depends on the surface where the impact takes place, and the impacting rock.
- The bigger the ball, or the faster it was moving, the bigger the crater.
- Larger, faster-moving balls have more kinetic energy (moving energy) than smaller, slower-moving balls.
- The energy is transferred to the flour and cocoa powder when the ball hits, causing it fly outward, creating the crater.
- The impacts churn up the "soil" (cocoa powder), bringing some of Earth's "bedrock" (flour) to the surface near the impact site.
- The pattern around the crater was probably symmetric if you dropped the ball straight down. Sideways impacts would result in asymmetric patterns as more flour/cocoa powder were thrown in one direction than the other.



Crater Isabella, impact crater on Venus



Meteor Crater in Arizona, June 7, 2007

Space Words



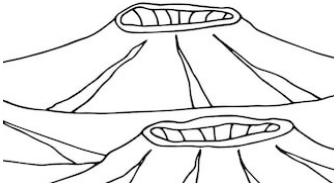



Asteroid: Small or large rocks that float around in space.

Comet: a rock that's icy and lets off dust and gas as it flies through space.

Crater: a round, bowl-shaped depression surrounded by a ring.

Meteor: a streak of light formed when a meteoroid enters a planet's atmosphere.

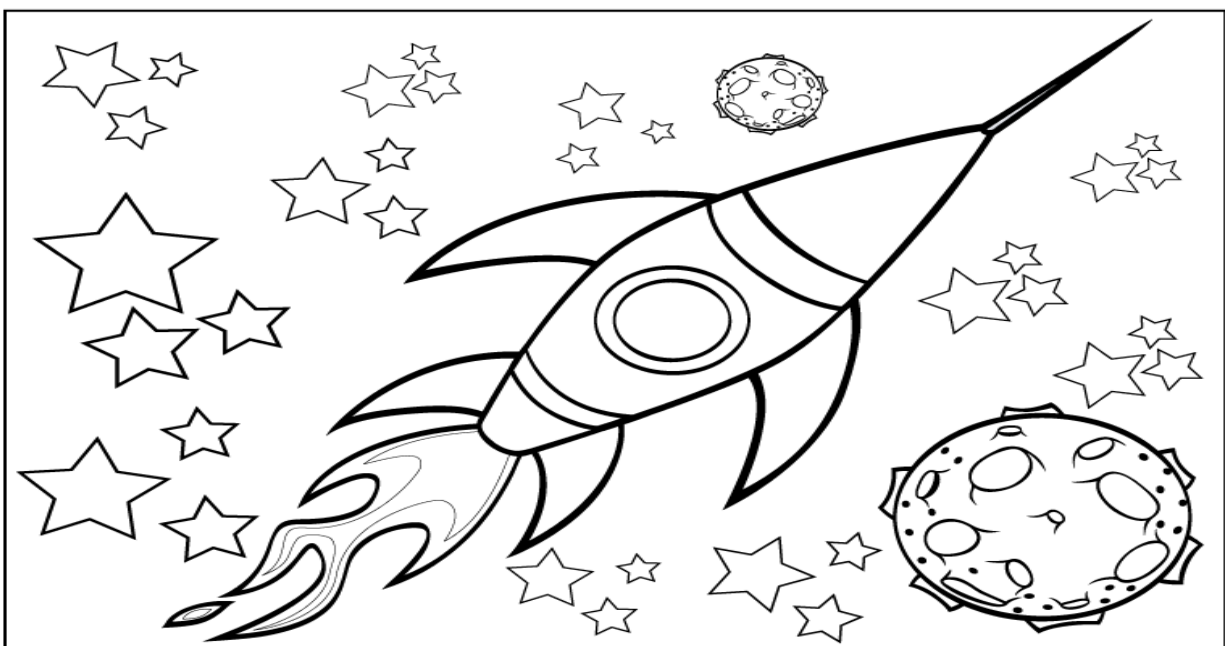
Meteorite: name for a meteoroid that has landed on a planet's surface.

Color In!	What is it?	Description (fill in the blanks)
	Comet	A rock that's _____ and lets off _____ and _____ as it flies through space.
	Meteoroid	A small chunk of _____ floating in space.
	Crater	A round, _____-shaped depression surrounded by a _____.
	Meteorite	A name for a _____ that has landed on a _____'s surface.
	Asteroid	Small or large _____ that float around in space.
	Meteor	A streak of _____ formed when a _____ enters a planet's _____.

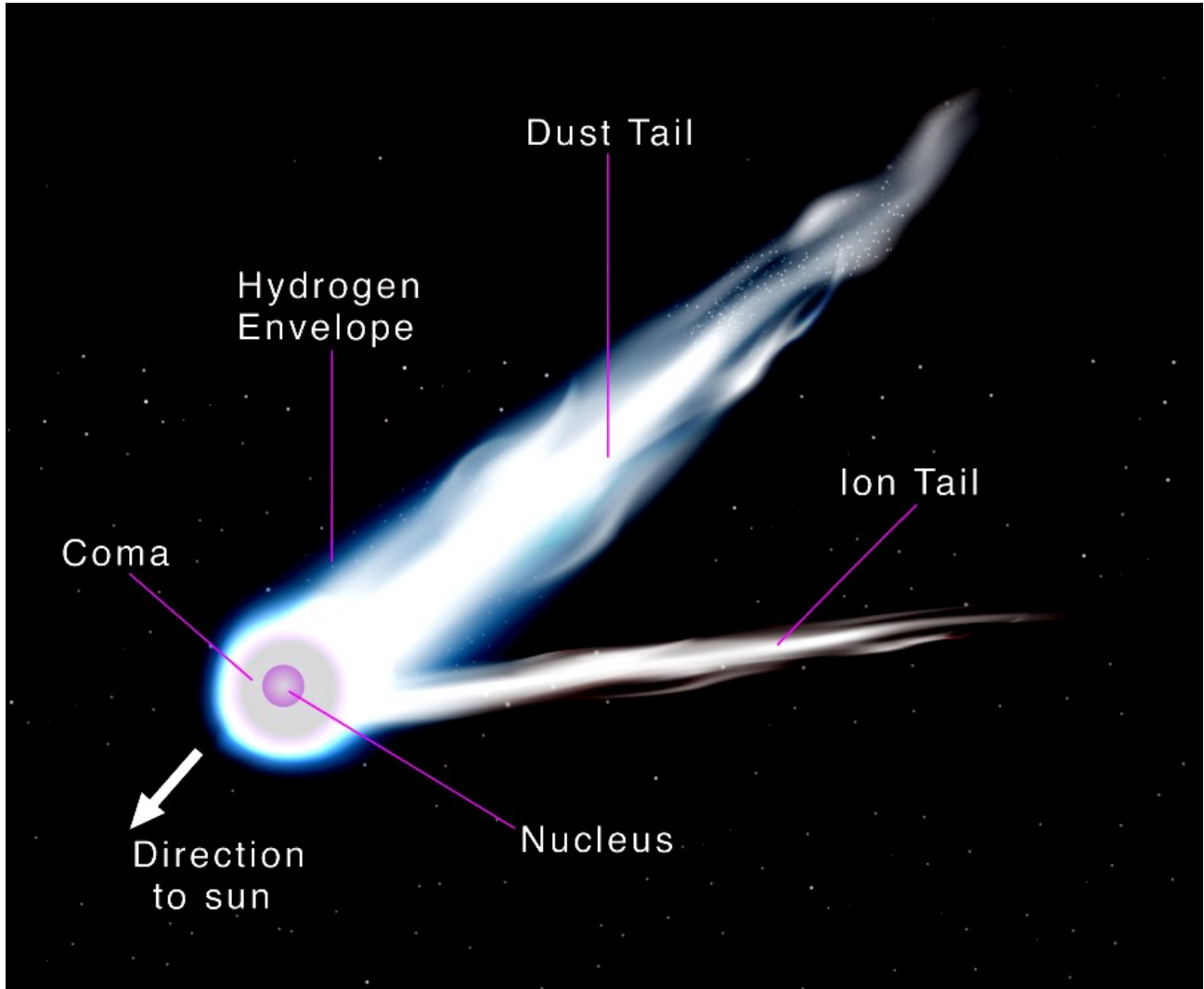
Asteroids, Comets, and Meteorites

O	E	D	M	O	O	N	A	O	A	I	S	S	S
Y	T	C	R	O	A	S	T	E	R	O	I	D	O
N	E	P	O	E	P	L	A	N	E	T	M	C	L
M	L	C	C	Y	N	P	E	A	K	E	C	I	A
R	E	O	K	G	M	E	C	C	L	I	A	T	R
E	S	O	S	A	T	O	S	R	A	P	A	S	S
E	C	C	I	R	C	O	N	A	S	P	A	A	Y
T	O	R	T	L	G	Y	D	O	A	C	S	M	S
C	P	A	M	R	T	A	U	E	R	M	C	E	T
H	E	T	A	O	T	E	S	A	O	T	T	Y	E
T	S	E	R	E	R	R	T	R	M	R	S	L	M
R	A	R	M	T	R	B	L	T	R	A	B	A	R
O	E	O	O	E	N	K	S	H	M	Y	I	I	I
E	C	P	L	M	P	E	E	S	M	R	C	O	T

- METEOR
- TELESCOPE
- ASTRONOMY
- TAIL
- CRATER
- ICE
- PLANET
- MOON
- ROCKS
- SOLAR SYSTEM
- DUST
- ORBIT
- ASTEROID
- SPACE
- COMET
- EARTH
- GAS



Comet Diagram



Nucleus: Mainly solid, mostly ice and gas with a small amount of dust and other solids.

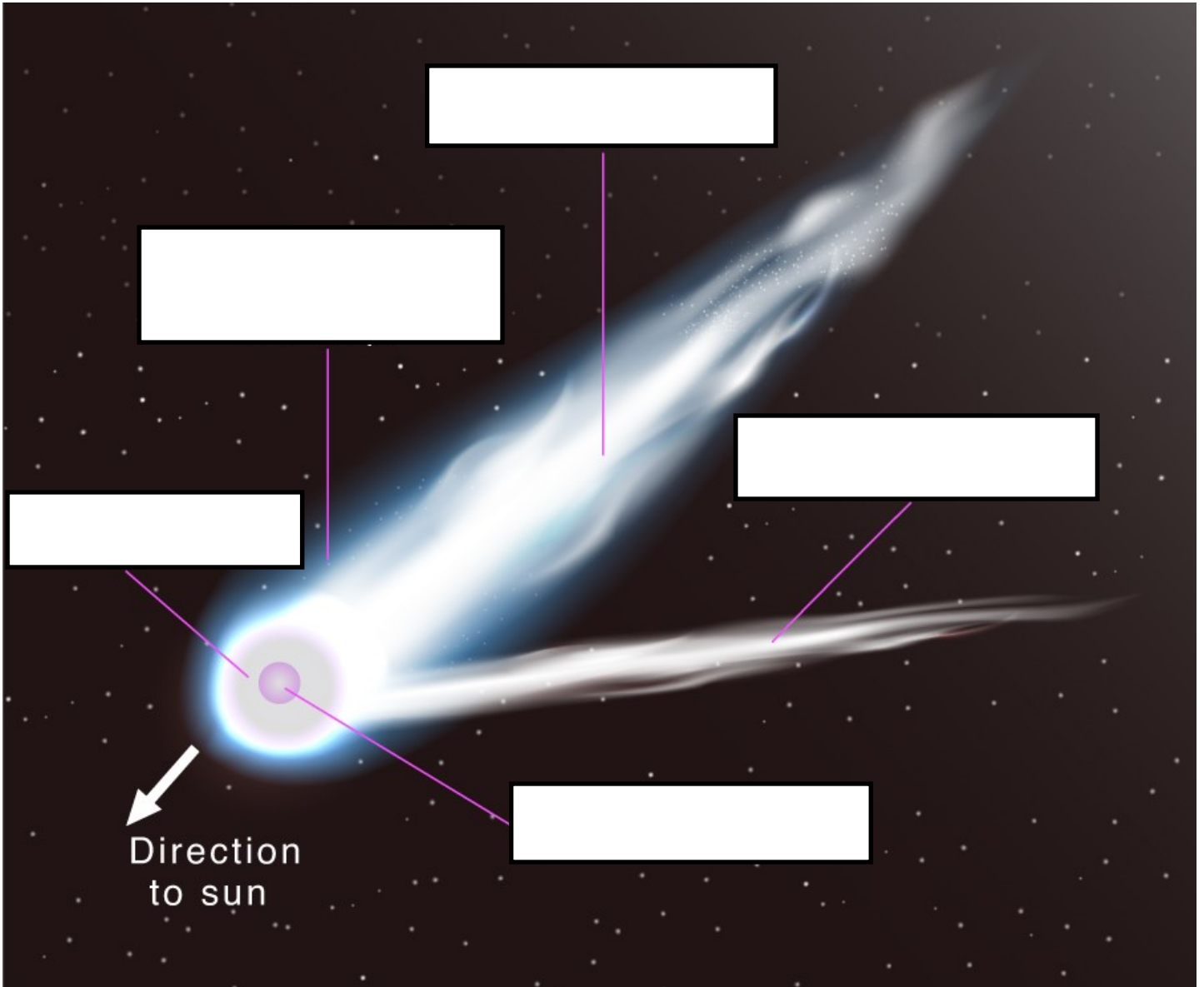
Coma: A dense cloud of water, carbon dioxide, and other neutral gases from the nucleus.

Hydrogen Envelope: Invisible, irregular cloud surrounding the coma.

Dust Tail: Up to 10 million kilometers (km) long, made of smoke-sized dust particles from the nucleus by escaping gases; the most prominent part of a comet visible to the naked eye.

Ion Tail: Several hundred million km long, made of plasma and laced with rays and streamers caused by interactions with solar wind.

Parts of a Comet



Use the following words to label the comet:

Coma

Dust Tail

Hydrogen Envelope

Ion Tail

Nucleus