

Another FREE SAMPLE LAB from TOPS LEARNING SYSTEMS!

This TOPS Idea is taken from an original series of black-and-white line masters, adapted to stand alone as an independent mini-lesson. Please purchase our original book to get the whole in-depth program.

relative size

...adapted from **SCALE THE UNIVERSE #44**
by TOPS Learning Systems

Spark a lively discussion about the relative sizes of things!

1. Make a magnified copy of these tabs. (*Tabs below are in correct order.*)
2. Cut them apart, mix them up, and distribute one per student.
3. Ask students to identify their tabs: "I've got the moon!"
4. Have students arrange themselves in a line from smallest **diameter** to largest.
(*Don't rush in with answers!*)



PROTON	JUPITER
OXYGEN NUCLEUS	MOON'S ORBIT
OXYGEN ATOM	SUN
RED BLOOD CELL	EARTH'S ORBIT
EYELASH (<i>diameter</i>)	SOLAR SYSTEM
PUPIL of your EYE	OORT CLOUD (<i>limit of Sun's gravitational influence</i>)
IN ARM'S REACH	<i>Our</i> STAR NEIGHBORHOOD (<i>perhaps 2000 light years</i>)
FERRIS WHEEL	MILKY WAY GALAXY
METEOR CRATER (<i>Arizona</i>)	<i>Our</i> LOCAL GROUP of galaxies
HUDSON BAY	VIRGO SUPERCLUSTER
OUR MOON	OBSERVABLE UNIVERSE
EARTH	

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OBJECTIVE

To qualitatively compare and sort distances, from subatomic to astronomic. To work cooperatively toward a more accurate understanding of how structures in the universe fit together.

DISCUSSION

Depending on academic level, some groups may need more discussion than others:

- An atom has a small, dense nucleus composed of neutrons and protons.
- All tabs can be imagined as spheres or circles where twice the radius equals the diameter.
- Our Sun's diameter (1,380,000 km) is roughly 1.8 times longer than our moon's orbit diameter.
- All Oort Cloud objects, from planets in our solar system to far-out comets, are bound by gravity to our massive sun/star.
- On a clear dark night, we can see a few thousand star/suns in our immediate "neighborhood" with the naked eye.
- Our star "neighborhood" spirals with billions of other stars in our home Milky Way galaxy.
- Our Milky Way circles with numerous neighboring galaxies to form a Local Group.

• Our Local Group rotates near the outer edge of many other groups of galaxies with the Virgo Group near its center. This huge, gravitationally bound "group of galaxy groups" is called the Virgo Supercluster.

• The Virgo Supercluster floats like a dust mote among 100 billion other galaxies that comprise the observable universe.

NOTES

1-2. There are 22 tabs. If you have fewer students, distribute pairs of tabs to hold one in each hand. These pairs must be relatively adjacent neighbors (like Moon and Earth), not separated (like Moon and Sun). Alternatively, groups of any size might tape all of the tabs along a table edge, or to a wall, as a cooperative class project.

EVALUATION

Describe your place in the observable universe between atoms and giant clusters of galaxies.

MATERIALS

- Scissors and tape.

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