Which is bigger: Moon or Sun?

This activity compares the apparent visible diameter of the Moon and the Sun. This uses ratios to reveal an interesting astronomical coincidence.

Facts:

	Moon	Sun	Ratio (Sun::Moon)
Radius (km)	1738.3	695950	400.4
Distance	251869 0.0025701 a.u.	98,000,000 1.00000 a.u.	389.1
Apparent size Radius/Dist	676355	695950	

As objects get farther away, they appear smaller. Their apparent size is directly proportional to their distance.

How many times can you fold paper?

This activity explores the powers of two.
Each time you fold paper in half, you double its thickness. Most people can fold typing paper 7 or 8 times, then it's impossible to bend it any more.

At some point, the total thickness is more than the amount of paper that's left.

At the end of one class, ask students to try it.
a)   How many times can they fold some photocopier paper?
b)   Does a *larger* sheet of paper (newspaper) work better than smaller sheets?
c)   Does a *thinner* sheet of paper (Kleenex) work better than thicker sheets?
d)   Does a different material (aluminum foil) work better than paper?
e)   Can you find something you can keep folding more than 10 times? 20 times? Forever?

Material	My result	Class result
Computer paper	6x (any size)	
1 ply of 2-ply kleenex	8x	
Newspaper	8x	
Plastic wrap	9x	
Alum foil	9x	

Secret note: You can fold some soft things forever: putty, play dough, pie dough, …

What is bumpier: a basketball, or the planet Earth?

Bring a basketball to class.

We will compare the proportional height of bumps. Compare the ratio "bump height" to "diameter".

a) Basketballs have little bumps.
    Measure the size of a bump. Measure the size of a basketball.
    Bump = 1/64th of an inch **Diameter** = 9.55 inches
                1/64 inches : 9.55 inches
                        1 : 611

b) The planet has bumps (called mountains).
    Get the height of the tallest bump (Mt. Everest). Get the size of the planet.
    Bump = 29,028 feet   **Diameter** = 7,899 miles
                29,028 feet : 7,899 miles
                5.498 miles : 7,899 miles
                        1 : 1436

A basketball bump is 1/611 of the diameter.
A mountain bump is 1/1436 of the diameter.
Which is taller? **The basketball bump is more than twice as tall!**