Exploring The Scale of the Universe

	Distance from Sun or Earth	**Diameter**
The Sun (Sol)		696,340 km
Earth	151,260,000 km (1 AU)	6,371 km
The Moon	384,400 km (from Earth)	1,737 km
Jupiter	5.45 AU	71,492 km
Neptune	30.33 AU	24,764 km
Alpha Centauri A (nearest visible star)	4.357 Ly	847,794 km
Sagittarius A* (nearest black hole)	26,000 Ly	13.4 X 10^9 km
The Milky Way		87,400 Ly
Andromeda Galaxy (nearest galaxy)	2.5 X 10^6 Ly	260,000 Ly
HD1 Galaxy (most distant galaxy detected)	13.463X10^9 Ly	?

1 Ly (Light Years)= 63241.1 AU (Astronomical Unit) = 9,460,733,897,365 km (9.4 trillion)

Visualising the scales

Find a range of spherical (or spheroidal) objects of very different sizes.

Object	Diameter
Gym Ball	~ 0.75m
Soccer Ball	0.22m
Tennis Ball	0.068m
Small Marble	13mm
Ball Bearings	0.250 - 300mm
Grain of Sand	0.06mm to 2.0mm

Using the largest spheroid object found, use this to represent our Sun.

Apply this scale to find an object to represent the Earth, The Moon and Jupiter.
Now calculate the relative distances between these objects.

Find a large open space and pace out the distances for these objects. Get someone to hold these objects at these distances.

Can you add Neptune to the demonstration?

Now, calculate relative distances for other astronomical objects. Try using coins as representations of concepts like the orbit of Neptune (to represent the Solar System).