Scale Models

I wanted my students to create a poster of a solar eclipse but I realized I had a problem with creating an accurate scale model. Complete the following two activities to better understand why we can't draw a solar eclipse correctly to scale on a regular poster paper.

Remember:

10mm= 1 centimeter *100cm= 1 meter* *1000mm= 1 meter*

Activity 1: The Sun and Earth to scale

Use the following website to calculate the size of the Earth and its scaled distance from the sun using 3 different sizes for the sun.

http://www.exploratorium.edu/ronh/solar_system/

Sun	***Earth (mm)***	***Distance (meters)***
1000mm (1 meter)		
400 mm (40 cm)		
150 mm (15 cm)		

Why can't we draw the Earth and Sun to scale on a poster?

Activity 2: The Earth and Moon to scale

(Modified from http://museumvictoria.com.au/scienceworks/education/ 3 Student activity)

Using 5 different size balls to represent the Earth calculate the size of the moon and its scaled distance. The Earth's diameter is about 4 times as big as the Moon's diameter. If we multiply the Earth's diameter by 30, the distance would approximate how far away the Moon is from the Earth. Place the ball on the table and use a ruler to measure its approximate diameter (D) in centimeters.

Type of ball (Earth)	***Earth's Diameter (cm)*** ***D***	***Moon's Diameter (cm)*** **D/4**	***Distance (cm)*** **D x 30**
Basketball			
Tennis ball			
Softball			
Squeeze ball			
Kickball			

Why is it still difficult to draw the Earth and moon to scale on a poster?

What does it mean if a picture or model is to scale?

Why are pictures/models still use useful even when not drawn to scale?