Name: \_\_\_\_\_\_\_**teacher key**\_\_\_\_\_\_\_\_\_\_\_\_

Circles and Telescopes

Based on a NASA activity found at: <http://nasawavelength.org/resource/nw-000-000-003-619/>

Measure the radius and diameter of each circle, and find the exact and approximate area. Then count how many pennies it takes to cover each circle.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Circle | Radius | Diameter | Exact Area | Approximate Area | Number of Pennies |
| 1 | **.9 cm** | **1.8 cm** | **.81π cm2** | **2.54 cm2** | **1** |
| 2 | **2.2 cm** | **4.4 cm** | **4.84π cm2** | **15.20 cm2** | **3.5** |
| 3 | **4.1 cm** | **8.2 cm** | **16.81π cm2** | **52.78 cm2** | **13** |

1

2

3

What do you notice about circles with a larger radius?

**Circles with a larger radius have a larger area, so you can fit more pennies in them.**

Telescopes work by collecting light from stars and planets using a mirror or lens. Some telescopes are even made up of smaller mirrors put together (similar to the pennies you filled the circles with, or **tessellations** of hexagons).

How do you think a telescope with a larger radius would be geometrically different from a telescope with a smaller radius? Would it work differently?

**The one with the larger radius will have a larger area and will collect more light. It will be able to see fainter stars. (Students may also note that if the telescope has many mirrors like a tessellation, it will not be a circle.)**