Check Your Understanding

1.1 Why don’t you ever see the new Moon in the sky?

1.2 Compared to the full Moon, how bright is the last quarter Moon?

1.3 Why is the Moon’s synodic period longer than its orbital period?

Features of the Moon

Of the 1,940 major named features on the Moon, 1,545 are craters. Other lunar features include:

- maria (pl., maria)
- rays
- rilles or rima
- wrinkle ridges.

You will need to know and locate the following 22 craters or crater pairs to complete Exercise 10.2, page 203.

When you look at the full Moon standing high in the southern sky, remember that astronomers have assigned the directions north and south to its top and bottom, respectively. The western part of the Moon is to your left, and the eastern part is to your right. This may sound wrong, because it means the western side lies nearest to Earth’s eastern horizon, and vice versa, but it is correct. It may help to think of the Moon like you would a map of the United States. On such a map, the western states lie to the left, and the eastern states are on the right. For this lab, the Moon is divided into four quadrants (quarters).

Northwestern Quadrant

The northwestern quadrant is the upper left part of the Moon (Fig. 10.8). This quadrant is dominated by the dark Mare Imbrium (Sea of Rains). The lighter “sea” to the north is Mare Frigoris (Sea of Cold). Between them lies Plato Crater. To the south of Mare Imbrium straddling the northwest and southwest quadrants, you can find Copernicus Crater in Oceanus Procellarum (Ocean of Storms). Other interesting features include Archimedes Crater, Aristarchus Crater, and Reiner Crater.
Archimedes Crater
Archimedes Crater (Fig. 10.9) lies at 30° north latitude centered between the eastern and western outer edges. This 83 kilometer-wide crater lies just northwest of the Moon's largest mountain range, the Montes Apenninus.

Aristarchus Crater
Aristarchus Crater (Fig. 10.10) measures 40 km across. Nearby, look for Vallis Schröteri (Schröter's Valley), the Moon's largest sinuous valley. It begins at a small crater 25 km north of Herodotus and runs for 160 km.

Copernicus Crater
Copernicus Crater (Fig. 10.11) is one of the Moon's most famous formations. It marks the center of a system of bright rays that extends for up to 800 km. Copernicus measures 93 km wide. Because of its great depth—3,750 meters—sunrise and sunset shadows here create dramatic relief. The central peak rises 1,200 m above the floor. Copernicus' outer wall gives it a peculiar hexagonal shape.

Plato Crater
Plato Crater (Fig. 10.12) lies at the Moon's top center for observers. Plato spans 101 km and has one of the darkest crater floors on the Moon. Polish astronomer Johannes Hevelius (1611–1687) called Plato the Greater Black Lake. One feature to observe within this crater is its slumped inner wall, especially on the western end. Even a small telescope will reveal the largest area, a triangular section that caved in millions of years ago.

Reiner Crater
Reiner Crater (Fig. 10.13), although only 30 km in diameter, features prominently within Oceanus Procellarum (the Ocean of Storms) on the Moon's western edge. Although its rim is nearly circular, Reiner appears oval. Just to Reiner's west, look for Reiner Gamma, a bright, flat albedo (reflective) feature that stretches for 70 km.
Northeastern Quadrant

The Moon’s northeastern quadrant is the part to the upper right as we view it from Earth (Fig. 10.14). It has five maria: Mare Serenitatis (Sea of Serenity), Mare Tranquillitatis (Sea of Tranquility), Mare Crisium (Sea of Storms), Mare Vaporum (Sea of Vapors), and Mare Fecunditatis (Sea of Fertility). Features in this quadrant include Lacus Mortis, Posidonius Crater, Taruntius Crater, and Trienecker Crater.

Lacus Mortis

Lacus Mortis, the Lake of Death (Fig. 10.15), spans 150 km and contains the 40 kilometer-wide Crater Bürg. Try to spot the rilles to the west of Bürg, which run for 60 miles (100 km). Lunar cartographers designated these collectively as Rima Bürg.

Posidonius Crater

Posidonius Crater (Fig. 10.16) measures 95 km across. Located on its floor, within its wall, and just outside its boundaries are numerous smaller craters. The largest, Posidonius J, lies to the north. When you have finished with Posidonius, look to its west in vast Mare Serenitatis for a series of wrinkle ridges, which formed when the lava that covered this part of the lunar surface early in the Moon’s history cooled.

Taruntius Crater

Taruntius Crater (Fig. 10.17) stretches 56 km and lies on the northwestern edge of the massive, dark Mare Fecunditatis. Taruntius has a double wall and a prominent central peak. At the northwestern edge of the crater, 11 kilometer-wide Cameron Crater breaks the outer rim. When you observe Taruntius, look for breaks in the lower, inner wall.

Trienecker Crater

Trienecker Crater (Fig. 10.18) sits nearly centered on the Moon. It spans 26 km, but is definitely not circular. When most observers point their telescopes here, it is not to observe the crater but rather the Trienecker Rilles (Rima Trienecker). This system is the Moon’s best-known system of rilles, and it extends in a north-south orientation for more than 200 km. When you observe it, use a magnification of 200× or more for the best results.
Southwestern Quadrant

The southwestern quadrant of the Moon is the part to the lower left as we view our lone natural satellite in the sky (Fig. 10.19). The large Oceanus Procellarum (Ocean of Storms) lies on the Moon’s western edge. To its southeast are two maria: the smaller Mare Humorum (Sea of Moisture) and the larger Mare Nubium (Sea of Clouds). The largest visible crater in this area is Tycho Crater, close to the southern edge. Other craters to look for are Clavius Crater; Fra Mauro Crater; Gassendi Crater; Moretus Crater; Ptitatus Crater; Prolemaeus Crater; Rupes Recta, or the Straight Wall; and Schiller Crater.

Clavius Crater

Clavius Crater (Fig. 10.20) ranks as the third-largest crater on the Moon’s nearside. It is visible to the naked eye and spans 225 km. But it is what is in Clavius that you should observe. Look for the crater chain of decreasing size that begins at Clavius’ eastern wall. Oblong Rutherfurd Crater measures 54 km by 48 km. Following it are Clavius D (28 km), C (21 km), N (13 km), J (12 km), and JA (8 km).

Fra Mauro Crater

Fra Mauro Crater, which measures about 80 km in diameter, represents the remains of a walled plain (Fig. 10.21). To its south sit two craters whose walls overlap those of Fra Mauro. Bonpland Crater (60 km) is another old walled plain, and Parry Crater (48 km) has a floor that flooded with dark lava several billion years ago. Look carefully on Fra Mauro’s floor for craterlets Fra Mauro E and Fra Mauro P.

Gassendi Crater

Gassendi Crater (Fig. 10.22), whose long axis measures 110 km across, has numerous clefts, hills, and central mountains that interrupt its floor. To the north, the crater Gassendi A has broken its wall. Together, both craters give the appearance of a diamond ring.
Moretus Crater

Moretus Crater (Fig. 10.23) sits in a heavily impacted region near the Moon's south pole. When the Sun angle is low here, the central peak that rises 2.1 km above the surrounding floor should be easy to spot. Moretus measures 114 km wide. Note that Short Crater immediately to Moretus' south is deeper, so it still lies in shadow in this image.

Pitatus Crater

Pitatus Crater (Fig. 10.24), which spans 97 km, contains many features strewn about its wide floor. A low central peak sits just to the northwest of the crater's center. Through an 8-inch telescope, look for the thin grooves called Rimae Pitatus on the western floor. More than 20 lettered craterlets surround Pitatus. Also be sure to observe the double-walled crater Hesiodus A directly to the west of Pitatus.

Ptolemaeus Crater

Ptolemaeus Crater (Fig. 10.25) is the largest and northernmost of a chain of three prominent craters that lie at the center of the Moon's near side. Alphonsus sits immediately to Ptolemaeus' south, followed by Arzachel. Ptolemaeus measures 153 km across. Scan its wide floor for numerous small craters. The easiest to see, Ammonius, measures 9 km across. Just north of Ammonius is the faint, saucer-like depression Ptolemaeus B.

Rupes Recta, the Straight Wall

Rupes Recta, the Straight Wall (Fig. 10.26), lies in Mare Nubium due east of Birt Crater. The Wall runs for 110 km, is 2.5 km wide, and rises 240 m to 300 m above the surrounding floor. Although through your telescope it may look like a sharp cliff, it actually slopes at a gentle 7°.

Schiller Crater

Schiller Crater (Fig. 10.27) is an elongated lunar impact feature that measures 179 km by 71 km. Note Schiller's terraced inner wall. Increase the magnification, and you will spot the double ridge along the center of the crater's floor toward the northwest.

Tycho Crater

Tycho Crater (Fig. 10.28) is one of the Moon's most famous features. It has an extensive system of rays that stretches more than 1,450 kilometers. Tycho's diameter is 85 km, and it has a depth of 4.8 km. The central peaks rise 1.6 km above the floor.
Southeastern Quadrant

The Moon’s southeastern quadrant is the lower right part of the Moon from our point of view (Fig. 10.29). This quadrant is dominated by the ray system of Tycho crater, but you can find a small “sea,” Mare Nectaris (Sea of Nectar). To the north of Mare Nectaris are Mare Vaporum (Sea of Vapors) and Mare Fecunditatis (Sea of Fertility). Craters here include Albategnius Crater, Cyrillus Crater, Messier and Messier A, Theophilus Crater, and Torricelli Crater.

Albategnius Crater

Albategnius Crater (Fig. 10.30) is so large that lunar scientists often refer to it as a walled plain. It measures 136 km across and bears many scars of more recent meteor impacts. The most prominent are Klein (44 km), which sits to the southwest, and Albategnius B (20 km), just inside the northern rim. Note that Albategnius’ outer wall has a rough hexagonal shape.

Cyrillus and Theophilus Craters

Theophilus Crater adjoins and sits to the upper right of Cyrillus Crater (Fig. 10.31). Theophilus measures 100 km across with a central triple peak towering 1,400 m above the crater floor. Cyrillus spans the same diameter as Theophilus, but its wall is not as intact. Look for the small, sharply defined crater Theophilus B at the northwestern edge of Theophilus’ wall.

Messier and Messier A

Double crater Messier and Messier A (Fig. 10.32) sit on the Moon’s eastern side only 2° south of its equator. Messier is an oblong crater measuring 9 km by 11 km. Messier A spans 13 km by 11 km. Two linear rays extend westward from Messier A for more than 100 km. If your sky is steady, look for the thin rille Rima Messier, which lies to the northwest of the craters.

Torricelli Crater

Torricelli Crater (Fig. 10.33) appears pear-shaped at first glance because its western wall is open and connects to a smaller crater to its west. Both craters lie in the upper part of a low-contrast circular formation named Torricelli R. The prominent crater to the east is 11 kilometer-wide Torricelli A. Torricelli Crater measures 23 km across.
Check Your Understanding

2.1 What lunar feature forms from bright material thrown out when a crater forms?

2.2 What quadrant of the Moon contains the most features?

2.3 What lunar feature is best described as a channel?

Observing the Moon

Full Moon (Fig. 10.34) is not the best phase to observe our natural satellite with a telescope. The week before or after the full Moon, when it is waxing gibbous or waning gibbous, is also not a good time to observe the Moon because the Moon is more than 50 percent illuminated. When the Moon is full, the Sun lies behind Earth (as we face the Moon) shining directly down on the lunar surface. Shadows are at their minimum lengths (like midday on Earth), and you can’t see much detail. You can observe the Moon when it is full, but the contrast between its light and dark sections will be better at other times.

Two intervals during the lunar “month” (from one new Moon to the next) are best for observers. The first begins shortly after new Moon and continues until two days past first quarter. Most people favor this span when the moon is a waxing crescent because the Moon lies in the evening sky (from sunset to midnight).

An equally good observing period starts about two days before last quarter and goes through waning crescent until the Moon lies so close to the Sun that it is lost in morning twilight. The last quarter Moon is observable from midnight to sunrise. At these times, shadows are longer and features stand out in sharp relief. Another benefit of observing the last quarter Moon is that the atmosphere before dawn usually appears steadier than it does after sunset.

During the two favorable observing periods described, point your telescope anywhere along the line that divides the Moon’s light and dark portions; this line is known as the terminator, the best location on the lunar surface for observing details. Between new Moon and full Moon, the terminator marks where sunrise is occurring. Between full Moon and new Moon, sunset happens along the terminator.

Here you can catch the tops of mountains protruding just high enough to catch the Sun’s light while surrounded by lower terrain that is in shadow (Fig. 10.35). Features along the terminator change in real time, and during a full night the differences are striking.

Students sometimes ask which telescope is best for lunar observing. Any telescope will provide excellent observations. You will get great views through small refractors, medium-size compound telescopes, and large reflectors. Those with several options (but not a permanent observatory) usually pick a telescope they can set up many nights in a row. Observing on successive nights makes it easier to follow the terminator’s progress.
**10.35** Lunar detail is best when sunlight falls on features at an angle (A) because the shadows produced help to accentuate the brighter areas. When sunlight comes from directly above (B), shadows are smallest and details are difficult to see.

**Cut Down the Moonlight**
Many observers use a neutral density filter (one that cuts down light of all colors equally) to reduce the Moon’s light. Two other methods to reduce the Moon’s brightness are using high magnification or adding an aperture mask (Fig. 10.36). High powers restrict the field of view, thereby reducing light throughput. An aperture mask, which can be as simple as a round piece of cardboard with a small hole in it, causes your telescope to act like a smaller instrument that collects less light.

**Turn On Your Best Vision**
A good way to observe the Moon between its quarter and full phases is turning on a white light behind you. The addition of white light suppresses the eyes’ tendency to dark adapt at night. Not dark adapting causes the eye to use normal (daytime) vision, which is of much higher quality than dark-adapted (night) vision. So, you will see more detail because you are viewing with a better part of your eye.

**Work With a List**
One of the best ways to learn the Moon is to undertake an observing project. In the United States, the Astronomical League offers one such project, the Lunar Observing Club. You will learn a lot about our satellite as you work through their list of 100 lunar features.

**Dig for Details**
Challenge yourself, and see how small a crater you can detect in a given area. You will need a detailed Moon chart for this project. Choose a crater with a large, flat bottom from which to start. For example, if you search the large crater Plato, you will find four craterlets on its floor, each about 1.2 miles (2 kilometers) across. Lunar observers consider seeing these craterlets a test for a 6-inch telescope.
Check Your Understanding

3.1 Why is full Moon not a good time to observe our natural satellite?

3.2 Give several reasons why any telescope gives good views of the Moon.

3.3 Why will turning on a light help you observe a bright Moon?

Sketching the Moon

When you sketch the Moon, you have a choice between two areas. One is the lunar terminator, the line that divides the Moon's lit and dark parts. Details along the terminator are stunning, but sketching this area is challenging because sunset (before full Moon) or sunrise (after full Moon) is happening here, so shadows move quickly. The other area is located far from the terminator, which is easier to sketch because time is of less concern.

You also have a choice between using the traditional black-on-white method and using a white pencil or crayon on black paper method. If you choose to use a white pencil on black paper, draw the highlights first, rather than trying to capture shadows.

Drawing Near the Terminator

Figure 10.37 shows a sketch of the trio of craters Hevelius, Lohrmann, and Cavalerius on the western edge of Oceanus Procellarum. The artist used the white-on-black technique discussed in Chapter 8.

To sketch craters like these, locate them on the terminator one day before full Moon or two days before new Moon. Focus on rendering highlights along the terminator first and then work outward. Shadows will evolve naturally in your drawing because of the paper's black background. As your sketching skills improve, you may use a charcoal pencil to accentuate shadows if you feel it is necessary. Finally, if you are capturing a single feature, try to complete your sketch in an hour or less. Even shadows along the terminator won't move much in that length of time. Detailed sketches showing multiple features may take longer.
Drawing Far From the Terminator

How much time you take is less of a concern when you are sketching features far from the terminator. Figure 10.38 shows a sketch of Eratosthenes Crater using a black pencil with white paper.

To sketch craters like Eratosthenes, choose one day after first quarter or a day before last quarter to observe. You can use any telescope of reasonable quality. As you observe, increase the magnification to see the details within its walls and the elongated mountain at its center.

Using a black-on-white technique is perfect for capturing detailed sunlit areas such as a terraced wall. This technique is different from the first one because you sketch the crater outline and shadows first, followed by the surrounding terrain. Highlighted areas remain untouched.
Determining Feature Size

To determine the size of a feature on the Moon you will use a proportion to determine the size of the feature in question, both on your drawing and on the Moon chart (Fig. 10.39). First, you have to know the Moon’s diameter: 3,474 kilometers. Next, measure the diameter of the Moon chart in millimeters. Then divide the number of millimeters into the Moon’s diameter in kilometers. Your answer (call it M) is the scale for the Moon chart, in kilometers per millimeter. That is, each millimeter you measure on the Moon chart actually measures M kilometers. Now you can determine the size of any feature on the chart or on your drawing. For example, if you measure a feature on one of your illustrations to be 4 mm by 3 mm, on the Moon the feature actually measures 4 × M kilometers by 3 × M kilometers.

![10.39 Example for determining feature size.](image)

Calculation

The width of the image of the Moon (above) is 134.5 mm. The width of Mare Serenitatis on the image is 21 mm. To find its actual width:

\[
M = \frac{\text{actual diameter in km}}{\text{image diameter in mm}} = \frac{3,474 \text{ km}}{134.5 \text{ mm}} = 25.829 \text{ km/mm}
\]

Size of Mare Serenitatis: 21 mm × 25.829 km/mm = 542.409 km
Lunar Calculations

Because this lab takes approximately one month to complete, start immediately on the date your instructor chooses. Briefly observe the Moon (3 to 5 minutes) every clear night for the entire period. Make all your observations in the early evening between 7:00 p.m. and 9:00 p.m., and try to make your observations at approximately the same time each night. Record which night the Moon is no longer visible at your chosen observing time. Try not to miss a night, and be sure to record those nights when you couldn’t see the Moon because of clouds.

Procedure

Determining Current Observing Conditions

1. Fill in the dates of the major phases for the current lunation in Table 10.1 below. Begin with the last new Moon. You can find this information on the U.S. Naval Observatory Astronomical Applications Department Sun and Moon Data for One Day online almanac data sheet.

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<td>Full</td>
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2. Each night, before heading outside to observe, complete Table 10.2 on the data sheet, pages 199–200, including the current phase of the moon, the percentage of the Moon’s face that is illuminated, the time of moonrise and moonset, and the constellation in which the Moon currently resides. Refer to the U.S. Naval Observatory Astronomical Applications Department Sun and Moon Data for One Day online almanac data sheet and your planisphere to find the answers.
Recording the Moon's Features

1. Each night, you will draw a sketch of the Moon’s features in the circles on the data sheets, pages 200–202. Sketches do not have to be masterpieces, but, because you want to be accurate, each will take some time to complete. Carefully gauge the relative size of all features.

2. Label the following mountain ranges (if visible): Montes Apennines, Altari Scarp.

3. Label the following maria (if visible): Mare Crisium, Mare Frigoris, Mare Humorum, Mare Imbrium, Mare Nectaris, Mare Nubium, Mare Serenitatis, Mare Tranquillitatis, Mare Vaporum, Ocean Procellarum, Sinus Iridium, Sinus Roris.

4. Label the following craters (if visible): Aristarchus, Aristoteles, Copernicus, Cyrillus, Grimaldi, Hercules, Plato, Theophilus, Tycho, Walter.
**Recording Lunar Data**

**Table 10.2** Daily Moon Data for 30 Days

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<th>Illumination</th>
<th>Moonrise Time</th>
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### Exercise 10.1 Data Sheet

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### Sketching Lunar Features

Day 1

Day 2

Day 3

Day 4

Day 5

Day 6
Craters of the Moon

Exercise 10.2

1. Using the section on Features of the Moon, pages 186–191, to guide you, find and circle the following features on the Moon charts provided in Figure 10.40.

- Albategnius Crater
- Archimedes Crater
- Aristarchus Crater
- Clavius Crater
- Copernicus Crater
- Fra Mauro Crater
- Gassendi Crater
- Lacus Mortis
- Messier and Messier A
- Moretus Crater
- Pitarus Crater
- Plato Crater
- Posidonius Crater
- Ptolemaeus Crater
- Reiner Crater
- Rupes Recta, the Straight Wall
- Schiller Crater
- Taruntius Crater
- Theophilus and Cyrillus Craters
- Torricelli Crater
- Triesnecker Crater
- Tycho Crater

10.40 Moon charts: (A) full Moon (continues).
10.40 Moon charts (continued): (B) last quarter Moon, (C) first quarter Moon.

2 Which feature on the list is the largest? Which is the smallest?

3 Which is the Moon’s best-known system of rilles?

4 Which feature is known as the Straight Wall?

5 Which is the only double crater on the list?

6 Which crater has part of its wall caved in?

7 Which feature on the list is the darkest?

8 What is another word for “rimae”?

9 Several of the craters listed have visible ray systems. Name one.

10 Name one of the two craters with an unusual, six-sided shape.
Unaided Viewing of the Moon

The goal of this exercise is to introduce you to observing the Moon. This observation is done entirely with the naked eye—that is, with no binoculars or telescope. If you wear eyeglasses for distance (you are nearsighted), wear your glasses when making this observation. This exercise will begin teaching you how to recognize lunar features.

1. In the circle below, make a sketch of the Moon as you see it with the naked eye. Perfect details are not necessary in this drawing. Later you will go back and identify features you have drawn from the Moon chart. Look for light and dark patches, craters, lines, markings, etc.

2. Use a pencil to make your drawing. You can also use the pencil to shade areas. This drawing is best made around the time of the full Moon.

Materials
- Flashlight (if needed, for answering questions and drawing in a dark location)
- Sketching pencils
- Eraser
- Clipboard (to hold your papers)
3. After completing your drawing, answer the following questions:

a. How hard was it to differentiate between the Moon’s dark features and the light features?

b. “Things” in the Moon—such as the man in the Moon, the rabbit, a woman, a witch, etc.—are part of lunar folklore. Did you see any shapes that looked like any of these—or even some other familiar shape? What do you think causes the shapes?

c. What colors, if any, did you see?

d. How appropriate was Apollo 11 astronaut Buzz Aldrin’s comment “magnificent desolation”? Explain your answer.

e. Which do you think would be easier to observe, a full Moon or a quarter Moon (50 percent illuminated)? Why?

f. What was the hardest thing about observing the Moon for this procedure?
Telescopic Viewing of the Moon

The goal of this lab exercise is threefold: general lunar observing, seeing lunar details, and estimating lunar feature sizes. There will be telescopes (and possibly binoculars) set up for viewing. Each section asks you to make specific observations. Most of these questions and observations are best done at the telescope. You will need the Moon chart provided in your lab manual. Plan to complete the sizes of lunar object calculation after you finish observing, preferably indoors.

1. Record your observing conditions below.
   Place of Observation: ____________________________
   Overall Sky Conditions: _________________________
   Start time: ____________________________
   End time: ____________________________

2. Look through all of the telescopes, and complete Table 10.3, page 209, on the data sheet.

3. Which telescope (or binoculars) gave you what you considered the best (or most-impressive) view? What did you like about this view of the Moon?

4. In circle A on page 209, make a sketch of the Moon. Perfect details are not necessary in this drawing. However you will need to identify four (4) features and be able to accurately determine the size of one of the four features from your lunar sketch.

   Telescope: ____________________________
   Magnification: ____________________________

5. Identify at least four features on your drawing using the Moon charts (Figure 10.40 on pages 203–204). Try to draw these features accurately, size-wise. How difficult was it to draw the Moon? Specifically, what did you find difficult?

6. In circle B on page 209, make a sketch of one (1) identified lunar feature (we recommend a crater). Try to be as accurate as possible.

   Telescope: ____________________________
   Magnification: ____________________________

7. How difficult was it to draw a specific lunar feature? How was this different than drawing the entire visible Moon?
8 Using the Moon chart provided, determine the scale of the photograph. Show your calculations.

Number of millimeters north to south: __________________ mm

Moon chart scale: __________________ km/mm

9 Measure the diameters (in millimeters) and compute the actual diameters (in kilometers) of the craters listed in Table 10.4 on page 210. There is space provided in the table to show your calculations for determining the diameters of the lunar craters.

10 Choose one of the four features you drew in step 1 (not one of the six listed in Table 10.4). Determine the size of the feature on the Moon chart, and then compare it with the size you drew on your general lunar sketch. How did the size of the crater you drew compare with the same crater on the Moon chart?
# Recording Telescopic Observations of the Moon

**Table 10.3 Impressions of the Moon**

<table>
<thead>
<tr>
<th>#</th>
<th>Telescope (or Binoculars)</th>
<th>Impression: How the Moon &quot;Looks&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diameter</td>
<td>Magnification</td>
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<tr>
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</tr>
<tr>
<td>2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
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</tbody>
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**A**

**B**
<table>
<thead>
<tr>
<th>Crater</th>
<th>North to South</th>
<th>East to West</th>
<th>Calculations</th>
<th>Calculated size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aristarchus</td>
<td>mm</td>
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<td></td>
<td>km</td>
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<tr>
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<td>by</td>
<td></td>
<td></td>
<td>km</td>
</tr>
<tr>
<td>Copernicus</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td>km</td>
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<tr>
<td></td>
<td>by</td>
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<td></td>
<td>km</td>
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<tr>
<td>Cyrillus</td>
<td>mm</td>
<td>mm</td>
<td></td>
<td>km</td>
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<td></td>
<td>by</td>
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<td>Plato</td>
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