

Lesson 5

THE SUN AND THE MOON

OBJECTIVES:

- * To become aware of the relative positions of Sun and Moon in the sky.
- * To learn the "fist" method of measurement.

GRADES: 4 and up.

SCHEDULING:

This activity should continue for as long as the students continue Moon-watching. A good time to start is three to ten days after the New Moon. (Of course, start on a clear day!)

STUDENT SHEETS:

- * Moon Position
- * Sun-Moon

ACTIVITY:

The idea presented in this lesson is simple, yet powerful. The Sun-Moon record sheet allows the students to concentrate on the one variable that is most significant in understanding the phases of the Moon: the relative position of the Sun and Moon in the sky. However, you should let the students discover this from the records of their observations.

Hand out the "Moon Position" sheet. Explain that the students will record the Moon's position with respect to the Sun. The "fist" system will be used for measurement. Astronomers use more precise methods, but with practice, fist measurements can be accurate to 10 degrees. This is quite

adequate for the purposes of this unit. Emphasize that the method works only if your arms are always completely stretched out. Practice by trying to measure the angle from the horizon to overhead: you should get approximately nine fists (Figure 5-1).

For more accuracy, suggest the students make each measurement two or more times and use the average -- or the most frequent result. There will be differences between measurements obtained by different students. (They are usually due more to wobbly arms and bent elbows than to differences in body size.) In any case, what is important is that each student's measurements are consistent.

From now on, remind your students daily that in addition to entering their Moon observations on the Moon Calendar, they should also enter any daytime observation of the Moon on the Sun/Moon sheet.

The Moon is often hard to find during the day. In order to get many entries on their Sun-Moon sheets, encourage your students to look for it shortly before sunset, or for early risers, shortly after sunrise.

CONCLUSIONS:

As the weeks go by, the following conclusions can be reached:

- * The Moon's position with respect to the Sun changes from day to day.
- * The Moon's motion with respect to the Sun is from West to East (right to left).

* The Moon's shape is related to its position with respect to the Sun: the further it gets from it, the fuller it is.

Do not rush students to these conclusions. They are ideas that most adults are not familiar with, and only prolonged observation makes them easy to grasp.

COMMENTS:

* A single record sheet for the daytime position of the Moon should not be used for more than one cycle of the Moon (four weeks). Give out a new copy every four weeks, or every New Moon.

* Alternate scheduling: this activity can be started on any clear day that the Moon is visible in the daytime. (Consult the ALMANAC for time of moonrise and moonset).

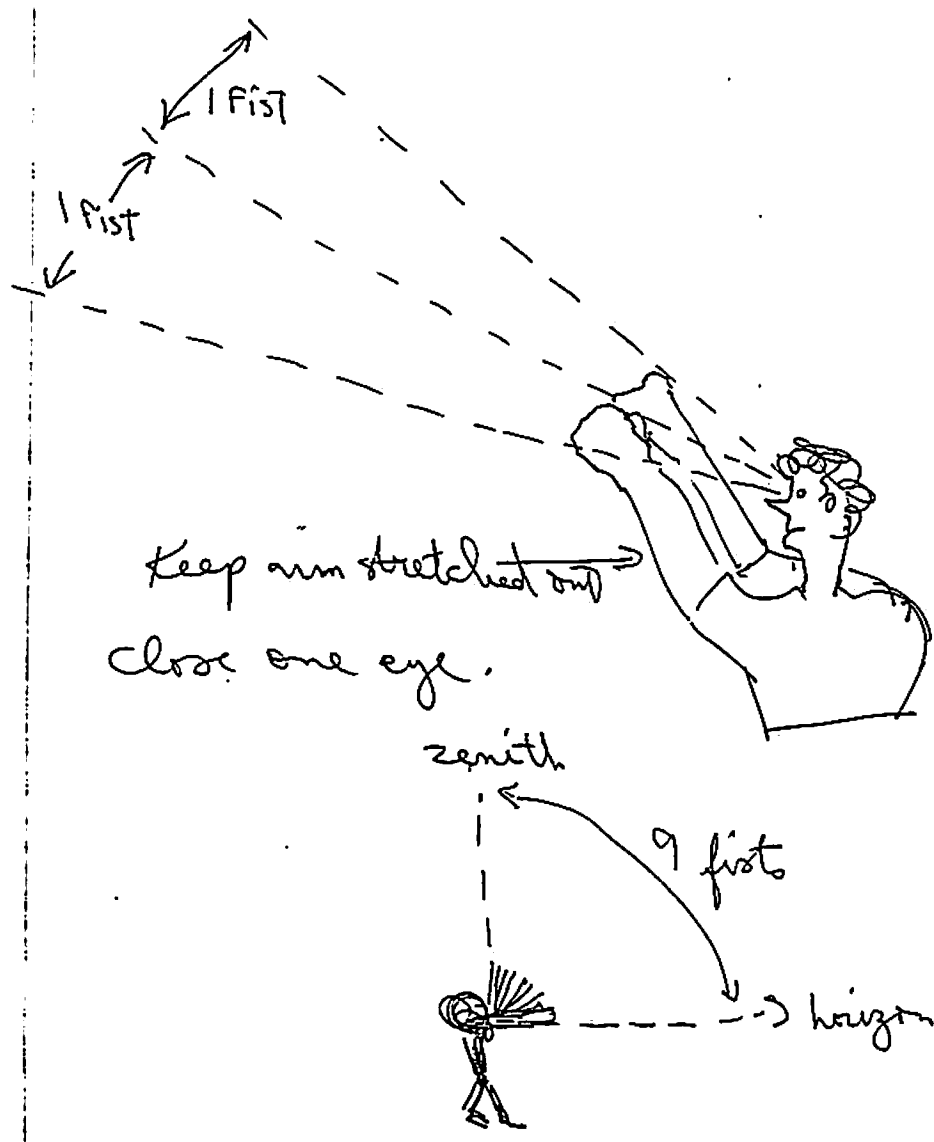


Fig. ~~5-1~~ 5-1

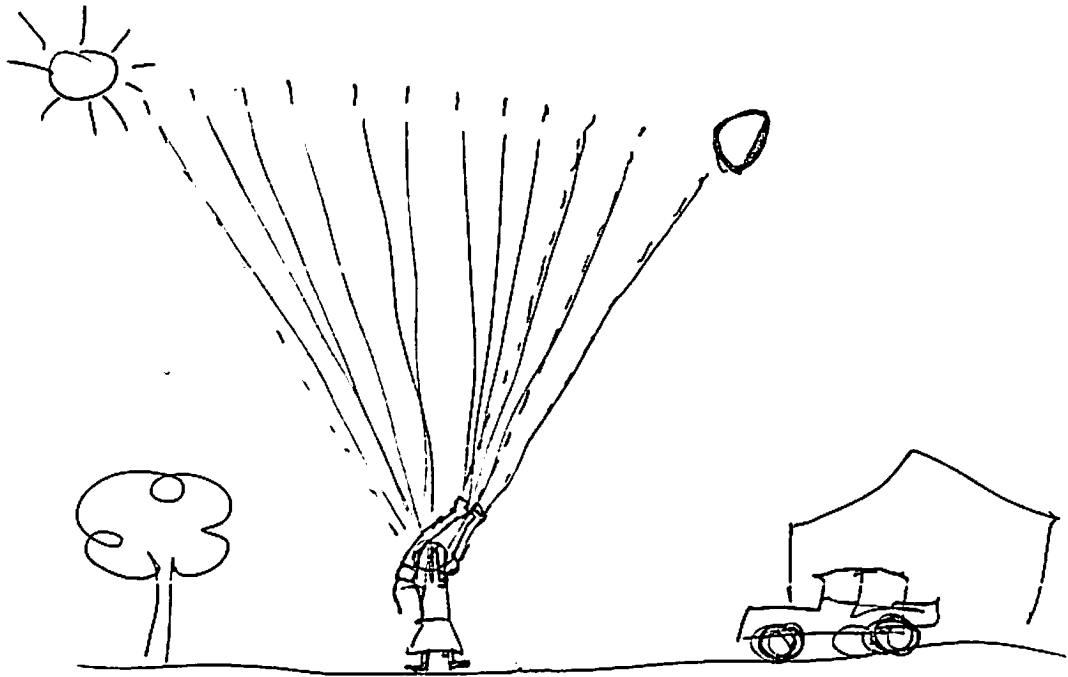
THE MOON'S POSITION <DAYTIME>

If you find the Moon in the daytime, notice its position with respect to the Sun.

Face South when making your observation. First note whether the Moon is to the East (left) or West (right) of the Sun. Measure the distance between the Sun and the Moon by counting fists: stretch out your arms, close your fists, close one eye. The width of your fist, when seen at arm's length, is your unit. Use your fists to measure distances in the sky (See Figure 1.)

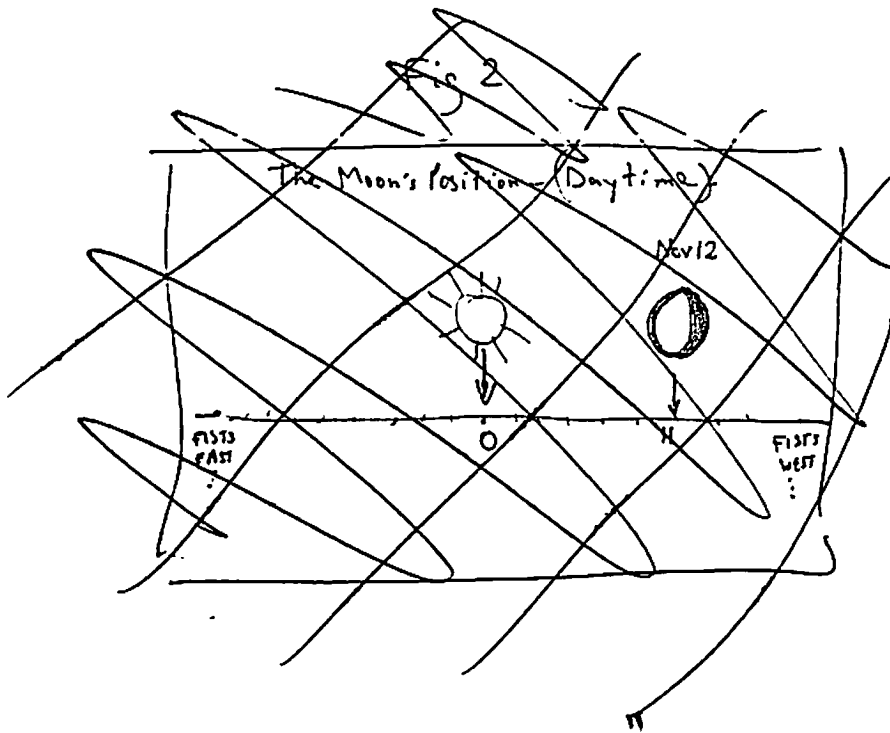
Once you have measured the distance, draw the Moon on the Sun-Moon sheet. Write the date next to it. Be sure you are drawing on the correct side of the Sun, and that your Moon faces the same way (left or right) as the one in the sky! (See Figure 2.)

From now on, whenever you see both the Sun and the Moon at the same time, use the Sun-Moon sheet to record your observation.



The Moon is 11 fists West of the Sun .

Fig 1



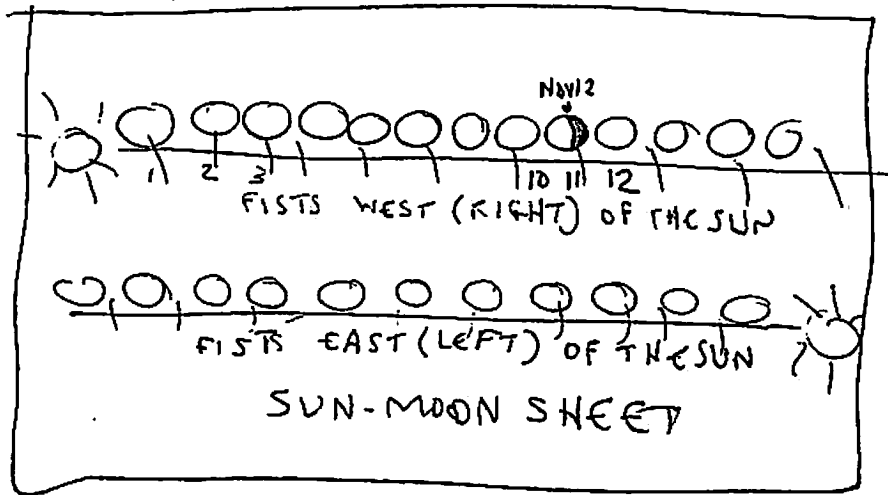
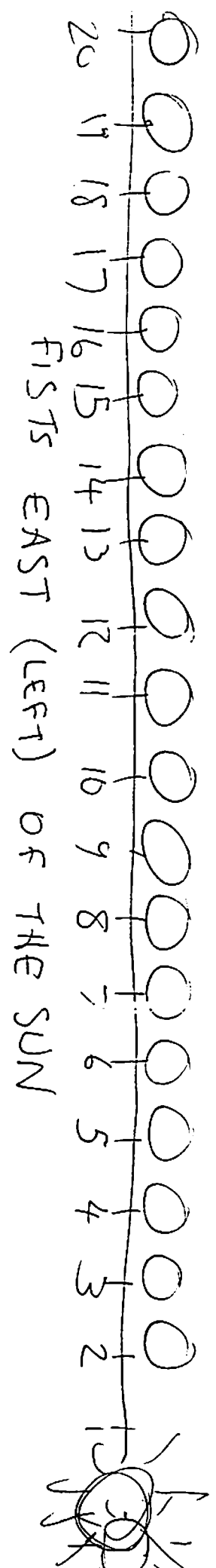
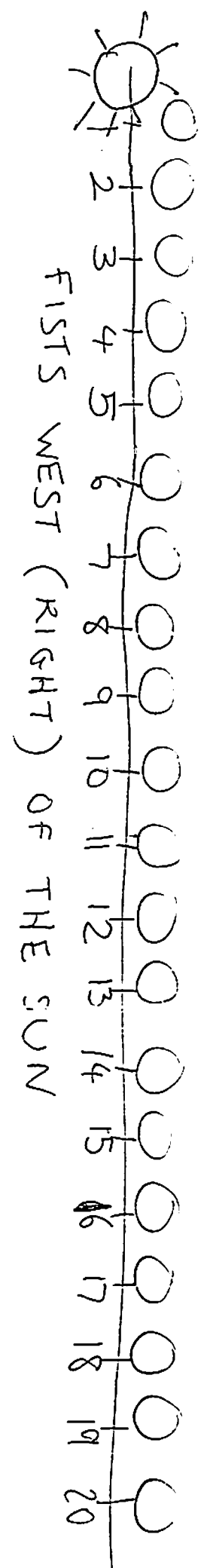


Fig 2



SUN-MOON SHEET