

Astronomy by Sight: The sun, moon, and stars

Equipment	Quantity required for 20 students working:		Unit cost	Supplier and catalog number	Comments	First use
	together as a class	semi-self paced				
Clear plastic ruler (1 ft. length) subdivided into 1/10" and centimeter scales	20	20		Local stores/supply	Students can supply.	
Clear plastic protractor Semicircular with 0.5 degrees divisions	20	20		Local stores/supply	Students can supply.	
Shadow plotting board: Materials needed: 1. Flat wooden board, 25-30 cm square 2. Small nail, with length approx. 3 cm larger than thickness of wooden board	1 1	1 1		Local hardware store/supply Local hardware store/supply	See Instructors Guide for <i>Astronomy by Sight: the sun, moon, and stars</i> for instructions on how to make.	1.1
Modeling clay	2 lb.	1 lb.	\$3.10	Delta ESS 16-030-8615	See also POM	1.6
Toothpicks	10	10		Local stores/supply		1.6
Flashlight, plastic, requires 2 D cells	10	5	\$2.50	Local stores/supply	See also L&C	1.6
Batteries, D-cell alkaline, 1.5 V	16	16	\$7.99/pk 8 \$9.99/pk 12	Radio Shack 23-650* or local stores	Also may use rechargeable NiCad batteries. See also L&C.	1.6
Drawing compasses	10	5		Local stores/supply		1.9
Metersticks	2	2		Local stores/supply	See also Kin.	3.4
Representation of sun in physical model: Materials needed: 1. Light bulb, socket, and cord (household variety) 2. Ring stand, base approx. 6" x 9", rod approx. 0.5" x 24" or 0.5" x 36" 3. Buret clamp (single), (A) with plain jaws, or (B) with plastic-coated jaws	1 8 10 10	1 8 5 5	\$10.95 (24" rod) or \$14.50 (36" rod) \$6.95 \$6.95	Local stores/supply Frey 15574176 (24" rod) Frey 1554179 (36" rod) Frey 15574110 Frey 15574266	See also POM and L&C. Bulb should be placed near the center of the classroom and at eye level to represent the sun. Use one ring stand and buret clamp to support the light bulb on a tabletop. Any alternative means of support is fine. Note: In Experiment 6.2, eight (8) ring stands and buret clamps (or similar equipment) are used to support sighting tubes.	4.6
Masking tape	1 roll	1 roll		Local stores/supply		4.7

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Magnetic compasses: Use some of the following: (A) Compasses, 23 mm diameter (with clear plastic case and top) (B) Compasses, 35 mm diameter	90 100	30 50	\$12.85/pk 30 \$2.25/ea	NASCO SB16729M Frey 15568397	See also Mag.	4.7
Balls to represent moon and earth: 1. Small foam ball (to represent moon), 8-10 cm diameter 2. Hard surface ball (to represent earth), 20-30 cm diameter	10 10	5 5		Local toy or hobby store Local toy or hobby store	Alternatively, each pair of students may use an Earth globe that can be picked up and held. (See Earth globes below.)	5.5 6.4
Sighting tubes: Pieces of hollow metal or cardboard tubing, approx. 2' long x 1" diameter	8	8		Local stores/supply	With 1" diameter tubes, a sighted star may take only 10 minutes to leave field of view. Use ring stands (see above) or similar equipment to support sighting tubes.	6.2
Small doll or figure, approx. 1" tall	10	5		Local toy or hobby store	Optional: A cheaper alternative is for students to make figures from small pieces of modeling clay.	OPT 6.4
Earth globes: Use one of the following: (A) 23 cm diameter, without meridian (B) 30 cm diameter, with half-meridian and tilted axis	10 10	5 5	\$18.95 \$35.95	Frey 155344324 Frey 15360984	For <i>Astronomy by Sight: the sun, moon, and stars</i> either type of Earth globe is fine. For <i>Astronomy by Sight: the earth and the solar system</i> the first type is suggested, but either type is adequate.	7.3
Thumbtacks or small nails	10	5		Local stores/supply		7.3