ACTIVITY SUMMARIES—QUARTER 2

ACTIVITY 11—A Compass in a Circuit
Students discover the phenomenon of electromagnetism by comparing the interaction of a compass needle and a magnet to that of a compass needle and a wire with electric current flowing through it. As both the magnet and the current deflect the compass needle, students are able to infer that the current must be producing a magnetic field around the wire. The students also discover the usefulness of a compass in detecting electric current in a wire.

ACTIVITIES 12 & 13—Plants and Solar Energy
Students are introduced to photosynthesis and the role that the Sun plays in plant growth. As a class, they construct two terrariums and place one in a sunny location and the other in a dark place. After 7–10 days, students compare the rate of growth in the two terrariums and conclude that solar energy is necessary for the growth and health of plants.

ACTIVITY 14—Transferring Solar Energy
Students build solar collectors to investigate the transfer of solar energy from an energy source (the Sun) to an energy receiver (the collector—a solar tray filled with water). In doing so, students also discover the effect that a cover has on the retention of heat absorbed by a solar collector.

ACTIVITY 15—Solar Energy and Tray Color
Students learn about importance of color in the absorption and reflection of solar energy. By comparing the water temperature of a black tray with that of a white tray, students conclude that the black tray absorbs much of the solar energy that hits it, while the white tray reflects much of the solar energy that hits it.

ACTIVITY 16—Solar Energy and Water Volume
Students set out two trays, each containing a different amount of water, and conclude that the smaller the volume of water, the more quickly it heats up.

ACTIVITY 17—Solar Energy and Exposure Time
Students measure the change in water temperature in their collectors over the course of 45 minutes. They conclude that the longer the collector is exposed to the Sun, the more energy it will absorb, up to a point.

ACTIVITY 18—Solar Energy and Tray Angle
Each team of students establishes a control solar collector that acts as a standard to which the experimental collector is compared. The variable tested is the angle at which the Sun's rays strike the solar collector. Students relate their results to the tilt of Earth's axis and its effect on seasons.

ACTIVITY 19—Designing a Solar Collector
Students apply what they have learned in previous activities about the factors that allow the maximum absorption of solar energy to the design and construction of an efficient solar collector.

ACTIVITY 20—Solar Cells
Students discover that partially obscuring a solar collector reduces the amount of solar energy absorbed by the collector. The result of this can be seen in the reduced speed of the motor.