Name(s): _____ Date: _____ Period: _____

A Discussion Guide to Physics Cinema Classics C Wave Propagation
Title 2 Energy Transfer
Lessons 1-8 to Accompany Activity #3 Waving At Me

Objectives:

- Students will identify the pulse and wave as being transverse in nature.
- Students will recognize the transfer of energy without the transfer of the medium.

Description

Title 2 shows three film scenarios depicting energy transfer. In the first scenario, a wave generated by a motorized boat, causes a small fishing boat to bob up and down as the wave front passes underneath the fishing boat. In the second, red dye added to the tank illustrates that the motion of the water is perpendicular to the direction of the energy transfer. In the third scenario, a slinky transfers energy along a bowling alley and tips over a bowling pin.

Teacher Information

In Title 2 Lesson 5 some of the dye spreads horizontally due to diffusion. While viewing the disc, use audio track A1 and pause to discuss the questions asked on the videodisc. Lessons 9 and 10 deal with a slow motion factor and are not necessary for the development of the objectives.

Discussion Guide

After showing the video, use the following questions to guide discussion.

1. Was energy transferred from the launch to the fishing boat? How do you know?
   Yes, the boat began to move because energy was received.

2. In the second case, does the water move from the paddle to the toy boats?
   No, the water moves up and down transferring energy only to the boats.

3. Did it take energy to topple the bowling pin? How do you know?
   Yes, because the pins would not move if a force had not been applied through a distance.

4. Where did the energy originate?
   The energy was provided by the bowler's hand.

5. In every case, how did the particles of the medium move relative to the direction of energy transfer?
   The particles of the medium moved perpendicularly to the direction of motion.

6. What type of wave is this?
   Transverse

Reinforce that in each case energy was transferred from one point to another, but the medium just vibrated about its equilibrium position.