

Do the Science

Instructional materials (text; kit) *FOSS Matter and Energy* This lesson is an extension to the FOSS lesson in Inv. 1, Part 3

Grade Level 4-5

Lesson: Energy on the Move

Big Idea: Energy can be transferred from one place to another and changed from one form to another. 4-5PS3B	
Lesson Learning Target: Draw and label diagrams of energy transfers in given energy systems.	Vocabulary: energy transfer, diagram, label
Success Criteria: I can draw and label diagrams that show energy can be transferred from one place to another. <ul style="list-style-type: none"> I can draw and label diagrams showing several ways that energy can be transferred from one place to another (e.g., sound energy passing through air, electrical energy through a wire, heat energy conducted through a frying pan, light energy through space). The diagrams <ul style="list-style-type: none"> ~show flow of energy into, through, and out of the system ~have labels for each component of the system ~have expanded labels (caption/s) that describe the energy transfer from one place to another in the system. 	Common Misconceptions: <i>“Energy is a complex concept. Even though students have heard the word energy, investing a lot of time and effort in developing formal energy concepts should wait until middle school (AAAS 1993). . . . Children have intuitive notions about energy (e.g., energy gets things done) that teachers can build on without getting into details of formal energy concepts. At this level, students can talk about energy but should not be expected to define it.” Uncovering Student Ideas in Science, Vol. 4, p. 55, P. Keeley and J. Tugel. ©2009 NSTA</i>
Elicitation Activity*: <ul style="list-style-type: none"> Review waves as directed in teacher’s guide. Model how to diagram energy transfer using the water wave observations (see page 3 of this lesson plan, “Demonstration energy diagram.” 	Talk structures/Discourse techniques: Teacher to class. Informal student to student discourse.
Target introduction/lesson Activities: Post the lesson learning target. Students complete energy transfer diagrams for at least three of the energy transfer stations they investigated during the previous lesson. These diagrams may be drawn on the backs of <i>FOSS Matter and Energy Science</i> Notebook sheets 6-7.	

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Embedded Formative Assessment/s:

Completed energy diagrams. See page 3 of this lesson plan, "Sample of a possible energy diagram."

Adjustment Trigger *What level of student performance will necessitate an instructional adjustment?*

Student meets all success criteria.

- Draws and labels diagrams showing several ways that energy can be transferred from one place to another (e.g., sound energy passing through air, electrical energy through a wire, heat energy conducted through a frying pan, light energy through space).
- The diagrams
 - ~show flow of energy into, through, and out of the system
 - ~have labels for each component of the system
 - ~have expanded labels (caption/s) that describe the energy transfer from one place to another in the system

Instructional Adjustment (if needed):

If majority of class -- reteach.

If 25 to 50% of the class – have students work in mixed ability groups to produce an energy transfer diagram and that they display and explain to the rest of the class

If less than 25% -- work with the small group separately

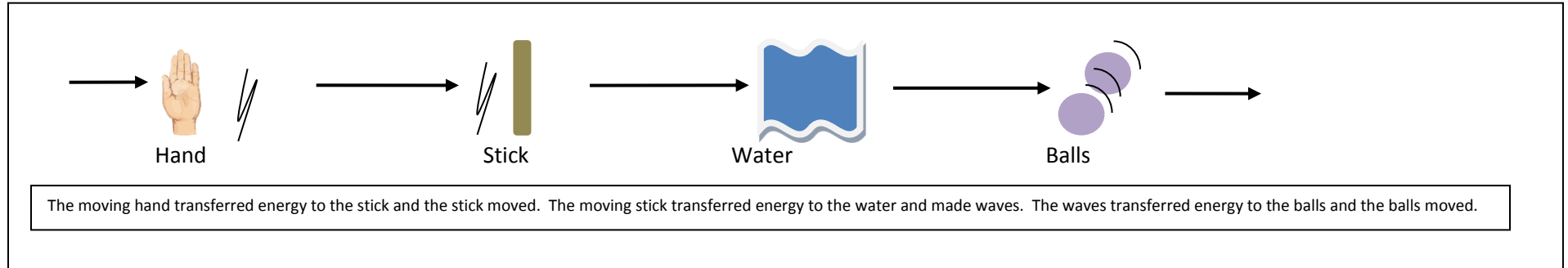
Lesson Closure: *

Exit ticket: each student chooses one of his/her diagrams to hand in as an exit ticket.

* Opportunity for formative assessment

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Demonstration energy diagram:



Sample of a possible energy diagram:

