

DI Lessons

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Instructions: Read the following lesson and use the completed “Content, Process, Product Grid” as a guideline for your small-group work.

Samples

Ex. 1 Elementary Geometry

Example Lesson: Elementary Geometry	
K-U-Do Concept: Recognizing Geometric Shapes	
Tier 1	Students receive a set of geometric shapes containing circles, squares, and triangles in two sizes and three colors. • Their first task is to locate the larger red circle. • Their second task is to find the same shape in a different color.
Tier 2	Students receive a set of geometric shapes containing circles, squares, triangles, and rectangles in two sizes and three colors. • Their first task is to locate the larger yellow rectangle. • Their second task is to find the same shape in a different color. • Their third task is to make a drawing of these two objects and explain how they know that these shapes are the same shape but different colors.
Tier 3	Students receive a set of geometric shapes containing circles, squares, triangles, rectangles, and hexagons in two sizes, three colors, and two thicknesses. • Their first task is to locate the smaller, thicker blue triangle. • Their second task is to find the same shape and thickness in a different color. • Their third task is to draw these two objects and explain how they know that they are the same shape and thickness

	but different colors. The fourth task is to select two other shapes from the set that use the same principle (they are the same size and thickness, but different colors).
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Example 1a -Content, Process, Product Grid for Elementary Geometry

	Tier 1	Tier 2	Tier 3
Content	Circles, Squares, & Triangles 2 sizes 3 colors	Circles, Squares, Triangles & Rectangles 2 sizes 3 colors	Circles, Squares, Triangles, Rectangles & Hexagons 2 sizes 3 colors 2 thicknesses
Process	1) Locate the larger red circle. 2) Find the same shape in a different color.	1) Locate the larger yellow rectangle. 2) Find the same shape in a different color. 3) Make a drawing of these two objects and explain how they know these shapes are the same shape but different colors.	1) Locate the smaller, thicker blue triangle. 2) Find the same shape and thickness in a different color. 3) Draw these two objects and explain how they know they are the same shape and thickness but different colors. 4) Select two other shapes from the set that use the same principle.
Product	None None		None

Lesson Options for Small Group Discussion

Instructions: Choose one of the following sample lessons for your small-group discussion.

Lesson Option A: High School Consumer Economics

Lesson: High School Consumer Economics	
K-U-Do Concept: Criteria for Buying Wisely	
Tier 1	Students will find criteria that will help them decide how to buy wisely. 1. First, students will select a category of products the teacher has provided. (All products in the list have been evaluated by Consumer Reports, and the products include many items in which the students are highly interested, such as sports equipment, electronics, computers, etc.) 2. Second, students will search for print ads about different brands of their selected product and clip them out. 3. Third, students will underline the words in the ads that advertisers of each brand have used to convince buyers to purchase their product. 4. Fourth, students will make a list of these “convincing” words. 5. Fifth, students will read the report about their product in Consumer Reports. As they read, students will look for the “convincing” words in their list from the ads. If they find any word from their list in the Consumer Reports article, students underline it. Students make a list of the criteria Consumer Reports used to investigate their product. 6. Sixth, students will create a Venn diagram comparing the Consumer Reports criteria to the ad words to see if there are any words in common. They will decide which resource—the ads or the Consumer Reports’ article—would help them make wise decisions about how to spend their money. 7. In a presentation to the class, they will show the diagram and discuss why it is important to make decisions based on the criteria rather than using “convincing” words.
Tier 2	Students will select a product category they wish to analyze according to criteria in Consumer Reports. They may select any product category that interests them (watches, radios, MP3 players, computers, stereo equipment, etc.). 1. First, students will read the Consumer Reports analysis of their product category, noting the criteria, which the magazine has used for its analysis. 2. Second, students will identify the five top-ranked models of their chosen product category and the brands of these items. 3. Third, students will seek ads for the top five products in newspapers and magazines. 4. Fourth, students will identify the language that advertisers have used to

	convince potential buyers to purchase these products. - Fifth, students will compare language in the ads with the criteria from the Consumer Reports analysis of their product category. - Sixth, students will discuss how the language in the ads attempts to minimize negatives and maximize positives, and often has little to do with facts. - In a presentation to the class, students will select one brand among the top five in their product category. They will compare the usefulness of the information they received about this product in Consumer Reports to the information from the collected print ads and discuss which is more useful for making a purchase.
Tier 3	Students will select a product they wish to analyze according to criteria in Consumer Reports. They may select any category of product that interests them (watches, radios, MP3 players, stereo equipment, etc.). - First, before reading the report on their product, students will generate a list of the criteria by which they think their product should be evaluated. - Second, they will research product information for a minimum of five different brands of their product on the Internet. - Third, students will use their criteria to evaluate each of the brands, based on the information available to them. - Fourth, students will rank at least five brands of their product according to their criteria. - Fifth, students will read the report on their product in Consumer Reports. - Sixth, students will compare the products and ranking of brands resulting from the evaluation using their own criteria with the products and ranking of brands in the Consumer Reports article. - In a presentation to the class, students will discuss (a) how using criteria helps you make a wise decision and (b) how consumer agencies like Consumer Reports provide objective criteria that are different than our own.

Lesson Option B: High School Physics

Lesson: High School Physics

K-U-Do Concept: Free-fall principle to study Newton’s Second Law of Motion
(This lesson has only two tiers)

Overview: As a year-end celebration, a physics class will spend a day at the regional amusement park. To prepare, students will examine the “physics” of amusement park rides. Based on an end-of-the-book test covering a variety of topics, students have been placed in groups.

In a presentation to the class, students will explain the physics principles involved in each of the steps and the ways in which roller coaster designers can simulate danger while maintaining safety.

Tier 1	1. Students will investigate rides that use the free-fall principle to study Newton’s Second Law of Motion. 2. They will read the information in their packets and watch a series of online demonstrations of free fall motion. Students will apply this background knowledge as they learn about its use to create feelings of weightlessness in amusement park rides. Rides might include roller coasters or other variations of rides in which there is an initial ride up a steep slope, a momentary suspension at the brink of the rise, and a downward plunge. To observe the free-fall phenomenon in action, students will do the “Weightless Water Trick” (see http://www.learner.org/exhibits/parkphysics/freefall2.html). 3. Students will demonstrate the Weightless Water Trick to the class and explain how amusement park designers use laws of physics to provide safe moments of perceived weightlessness to riders.
Tier 2	1. Students will read all of the information in their packets, then design a Roller Coaster with the help of an online design program. 2. They will assume that their coaster is a single-car coaster running on a frictionless track, with a mass of 800 kg and an acceleration due to gravity of 32 ft/s/s. Keeping the laws of physics in mind, students will (a) select the height of the first hill, (b) select the shape of the first hill, (c) select the exit path, (d) select the height of the second hill, (e) select a loop, and (f) view the entire coaster. Using the resulting safety rating, they will adjust the elements of the coaster ride until they are satisfied that it is both “physics-ly” safe and fun.

Lesson Option C: Elementary Science

Lesson: Elementary Science	
K-U-Do Concept: Understanding Erosion	
Tier 1	1. The teacher reads the book <i>Erosion</i> (J. Rutten, 1999) to students in this group, pausing to show the many pictures. As she reads, she asks students to tell what they are seeing in the pictures, and she writes descriptive words from their explanations on a chart entitled “Erosion.” 2. With the help of several parent volunteers, students collect soil samples from several different areas near the school. Together, they conduct a series of experiments about soil erosion (see http://www.mo14.nc.nrcs.usda.gov/features/erosiondemo.html) and discuss why controlling erosion is important. 3. Each student will write a story about why controlling erosion is important. The stories will be displayed along with a poster containing pictures of the experiments they have completed.
Tier 2	1. In groups of four, students will perform the following investigation: Place damp sand to one side of a baking pan and make a beach. Fill a pitcher with water and slowly pour the water into the other side of the pan until the water is about 3 cm deep. Place a ruler in the water at the side opposite the “beach” and make waves by gently moving the ruler back and forth. Observe what happens to the sand on the beach. Make a jetty by piling up pebbles in a line that extends from the middle of the beach into the water, about 5 cm. Predict what will happen to the beach now if you make exactly the same kind of waves as before. Use the ruler to make these waves, observe the results, and compare the results to your prediction. 2. Students will then read the book <i>One Day in the Desert</i> (J. C. George, 1983). 3. They will make a Venn diagram to compare and contrast erosion at the beach and erosion in the desert.
Tier 3	1. In groups of four, students will perform the following investigation: 2. Place damp sand to one side of a baking pan and make a beach. Fill a pitcher with water and slowly pour the water into the other side of the pan until the water is about 3 cm deep. Place a ruler in the water at the side opposite the “beach” and make waves by gently moving the ruler back and forth. Observe what happens to the sand on the beach. Make a jetty by piling up pebbles in a line that extends from the middle of the beach into the water, about 5

	cm. Predict what will happen to the beach now if you make exactly the same kind of waves as before. Use the ruler to make these waves, observe the results, and compare the results to your prediction. 3. After the initial investigation, students will position the ruler to make waves move in toward the beach from the left (sand is eroded from the left side and deposited on the right), and then on the right (with the opposite effect). Students will determine the function of a jetty. 4. They will read “Mats, Concrete, Blocks, and Rocks: The Lowdown on Riprap” (http://www.forester.net_0207_mats.html). 5. In a written report that will be shared with the class, students will compare the function of shoreline jetties with ripraps as tools for controlling river erosion.
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