

Creative Application Lessons for a 12-Year-Old

Math: The "Dream Bedroom" Budget & Design Challenge

Materials Needed:

- Graph paper (1/4 inch grid is ideal)
- Pencil and eraser
- Ruler
- Colored pencils or markers
- Calculator (optional)
- A few catalogs or access to online stores (like IKEA, Target, etc.) for "shopping"

Learning Objectives:

- The student will apply concepts of area and perimeter to a real-world design project.
- The student will create and manage a budget, practicing addition, subtraction, and multiplication with decimals.
- The student will create an accurate scale drawing on graph paper.

Lesson Activities (40 minutes):

1. Introduction & The Challenge (5 minutes):

Start by saying, "Today, you're not just a math student; you're an interior designer and a project manager! Your challenge is to design your dream bedroom. We'll start with a room that is 12 feet by 15 feet. You also have a budget of \$2,000 to furnish it. Can you create an amazing space without going over budget?"

Discuss the concepts of area (for the floor/rugs) and perimeter (for things like wallpaper borders or string lights). Define the scale for the graph paper: **1 square = 1 square foot.**

2. Blueprint & Design (15 minutes):

On the graph paper, the student will first draw the outline of the 12x15 foot room. Then, they will start designing the layout. They need to draw and place at least four key items (e.g., bed, desk, dresser, bookshelf). They must consider the actual dimensions of these items. For example, a twin bed is about 3 feet by 6.5 feet.

Encourage creativity! Where does the door go? What about a window? They can color and add details to their blueprint.

3. Budgeting & "Shopping" (15 minutes):

Now, the student "shops" for the items in their design using online stores or catalogs. They must find real prices for the items they've chosen.

They should create a simple budget sheet, listing each item, its price, and a running total. The goal is to stay under the \$2,000 limit. This is a great time to practice mental math or use a

calculator to work with decimals.

4. **Presentation & Wrap-Up (5 minutes):**

The student presents their final design and budget. Ask them to explain their choices. "Why did you place the desk there? What was the most expensive item? How did you decide to spend your money?"

Assessment:

- **Blueprint:** Is the scale drawing accurate? Are the room dimensions and furniture placement logical?
- **Budget Sheet:** Is the math correct? Did the student stay within the \$2,000 budget?
- **Verbal Explanation:** Can the student justify their design and budget choices, showing they understand the trade-offs involved?

Differentiation & Extension:

- **For Support:** Provide a pre-drawn room outline or a list of items with pre-set prices and dimensions. Start with a smaller budget or fewer required items.
- **For Challenge:** Add complexity. Introduce percentages for a "10% sales tax." Ask them to calculate the volume of the room. Require them to include flooring (like carpet at \$3 per square foot) or paint in their budget.

English: Blackout Poetry Creation

Materials Needed:

- A page of text from an old book, a magazine article, or a newspaper (photocopying a page is a great option to preserve books).
- A dark permanent marker (like a Sharpie).
- A pencil.

Learning Objectives:

- The student will analyze a text to identify powerful words and phrases (verbs, nouns, adjectives).
- The student will construct a new, original poem by selecting and arranging words from an existing text.
- The student will explore how tone and theme can be created through word choice and visual presentation.

Lesson Activities (40 minutes):

1. **Introduction & Exploration (10 minutes):**

Introduce the idea of "found art." Say, "Today, we are going to be word artists. We're not writing a poem from scratch, but finding one that's already hidden inside a page of text." Show an example of blackout poetry if possible (a quick search online beforehand helps).

Give the student the page of text. Their first task is to read through it once, just to get a feel for

the words. Then, ask them to go through with a pencil and lightly circle any words or short phrases that jump out at them—words that are interesting, strong, or beautiful.

2. **Crafting the Poem (20 minutes):**

Now, the student looks only at the words they've circled. They should try to link them together to form a coherent poem or create a specific feeling. The words must be read in order as they appear on the page (from top-to-bottom, left-to-right).

Once they have their final word selection, they take the dark marker and "black out" everything else on the page. They can draw lines, boxes, or creative designs to connect their chosen words, turning the page into a piece of visual art.

3. **Author's Reading & Reflection (10 minutes):**

The student shares their finished poem by reading it aloud. Ask reflective questions: "What theme or feeling were you trying to create? Which word is your favorite in your new poem and why? Was it hard to create a message from random words?"

Assessment:

- **Finished Poem:** The final blackout poetry piece serves as the primary assessment. Does it form a coherent (even if abstract) message or theme?
- **Word Choice:** Did the student select impactful words?
- **Reflection:** Can the student articulate their creative process and the intended meaning or mood of their poem?

Differentiation & Extension:

- **For Support:** Use a text with simpler vocabulary and sentence structure, such as a page from a middle-grade novel. Work together to find the first few "anchor words" for the poem.
- **For Challenge:** Ask the student to create two different poems from the same page of text to see how word choice changes meaning. Or, challenge them to create a poem around a specific theme (e.g., hope, loss, nature).

Science: Engineering a Balloon-Powered Car

Materials Needed:

- Cardboard (a small piece for the car's body)
- Four plastic bottle caps (for wheels)
- Two drinking straws (one wide, one regular)
- Two wooden skewers (for axles)
- A balloon
- Tape
- Scissors
- A tape measure

Learning Objectives:

- The student will apply the engineering design process (build, test, redesign) to solve a problem.
- The student will construct a vehicle that converts potential energy (air in the balloon) into kinetic energy (motion).
- The student will explain how their car demonstrates Newton's Third Law of Motion (for every action, there is an equal and opposite reaction).

Lesson Activities (40 minutes):

1. Introduction & Scientific Principle (5 minutes):

Ask, "Have you ever let go of a balloon you've blown up but not tied? What does it do?" Explain that this is a perfect example of Newton's Third Law of Motion. The **action** is the air rushing out of the balloon backward. The **reaction** is the balloon shooting forward.

"Today's challenge is to harness that power! You will engineer a car that is propelled forward by nothing but a balloon."

2. Build & Design (20 minutes):

Guide the student through the construction process:

1. Cut a rectangular base from the cardboard.
2. Cut the wider straw into two small pieces and tape them to the underside of the cardboard. These will hold the axles.
3. Carefully poke a hole in the center of each bottle cap. Slide the skewers through the straw pieces and attach the bottle caps as wheels. Make sure they spin freely!
4. Tape the regular straw to the top of the car. Attach the balloon to one end of this straw. This is the engine! The student will blow up the balloon through this straw.

3. Test, Measure, & Improve (10 minutes):

Find a smooth, open space. The student blows up the balloon (through the straw), pinches it closed, sets the car down, and lets go! Use the tape measure to see how far it traveled.

This is the key part: Ask, "How can we make it go farther?" Encourage critical thinking. *Is there too much friction? Are the wheels wobbly? Is the balloon pointing straight back?* Allow them to make one or two modifications and test again to see if their changes improved the performance.

4. Conclusion & Explanation (5 minutes):

Ask the student to explain, in their own words, how the car works, using the term "action-reaction." "What is the action? What is the reaction? What change did you make that helped it perform better?"

Assessment:

- **Functional Car:** Did the student successfully build a car that moves under balloon power?
- **Problem-Solving:** Did the student identify a potential problem during testing and attempt a modification to fix it?
- **Scientific Explanation:** Can the student correctly identify the action and reaction forces at play, demonstrating an understanding of Newton's Third Law?

Differentiation & Extension:

- **For Support:** Pre-cut some of the materials or provide a simple visual diagram of the steps. Focus more on the fun of building and testing than on the precise scientific explanation.
- **For Challenge:** Create a "race." Can they design a car that can carry a small weight (like a few coins taped to the top)? Challenge them to calculate the car's average speed (Speed = Distance / Time).