Literacy T-Chart – 3-2-1

CIP 46.0101 Mason/Masonry

Identify multistep procedures and analyze results based on the text.

Program Task:	PA Core Standard: CC.3.5.11-12.C
502: Square a building using the 3-4-5 Pythagorean Theorem.	Description: Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Program Associated Vocabulary:	Reading Associated Vocabulary:
Pythagorean Theorem Hypotenuse Right triangle Leg Diagonal Dissection Concrete slab Protractor Square root Carpenter's square	Analyze Procedure Summarize

Program Strategy:	Literacy Strategy:
Use the 3-2-1 strategy to ensure students can identify steps in a procedure and potential outcomes prior to attempting the procedure. After introducing the 3-2-1 strategy, present the following prompts to the students. Suggested answers are in italics. **3-Identify 3 steps in squaring a form.** *Find the corner that has a right angle and measure 3 feet from the corner and mark it.* *Measure 4 feet from the corner on the other leg and mark it.* *Measure the length of the side opposite the right angle. It should be 5. If not, adjust the legs.* **2- Explain 2 cautions when squaring a form.**	*Whole Group* Explain to students that developing the ability to identify key information during a process is a critical skill. The 3-2-1 strategy helps students pinpoint elements that they will need to remember and use. *Guided Practice* Show a brief passage electronically that all students can read, followed by 3-2-1 prompts. Read the passage aloud and model how you locate the answers to the prompts. Use content already familiar to students or a simple recipe so students can focus on the strategy rather than learning the content. Use prompts such as the following: 3 – What are the three steps? 2 – What two cautions are given? 1 – What is the one primary result that is expected?

Program Strategy:	Literacy Strategy:
Measurements must be accurate. *Calculations using the Pythagorean Theorem work only when two sides are known.* **1-Describe 1 benefit of using 3-4-5 and the Pythagorean Theorem to square forms.** *The 3-4-5 and the Pythagorean Theorem provide a practical method for squaring small and large concrete forms.* ***Squaring a form.*** *One of the challenges when creating corners for your concrete form is getting them square. The 3-4-5 method is useful for masonry and carpentry projects, ensuring that the form for the foundation footing is square.* ***Understand the 3-4-5 method.*** *If a triangle has sides measuring 3, 4, and 5 feet (or any other unit), it must be a right triangle with a 90⁰ angle between the short sides. If you can "find" this triangle in your corner, you know the corner is square. This is based on the Pythagorean Theorem from geometry: $A^2 + B^2 = C^2$ for a right triangle. C is the longest side (hypotenuse) and A and B are the two shorter legs.* *3-4-5 is a very convenient measurement to check because of the low, whole numbers. The math checks out: $3^2 + 4^2 = 9 + 16 = 25 = 5^2$.* ***Measure three units from the corner along one side.*** *You can use feet, meters or any other unit. Draw a mark at the end of three units.* *You can also use multiples of each number (multiply each number by the same amount and still use this) for larger sizes. For a large room, use 6-8-10 or 9-12-15 feet or meters. You can use 30-40-50 centimeters if using the metric system.* ***How to measure.*** *First measure three units along one leg. Using the same unit, measure along the second leg. Mark this point at four units.* ***Measure the distance between your marks.*** *This is the hypotenuse and if the distance is 5 units, your corner is square.* *If the distance is less than 5 units, your corner is less than 90⁰ and not square. Move the sides apart.* *If the distance is over 5 units, your corner has a measurement of more than 90⁰ and is not square. Bring the sides closer together. Continue checking until 3, 4 and 5 are accurate and the corner is square.*	Point out that this is a form of summarizing information without writing a paragraph. *Application* Provide students with a text that gives a process that students need to apply. After giving them time to read the material, give your prepared 3-2-1 prompts to be completed accurately before they are allowed to perform the procedure. Review answers with students either individually, in teams or with the whole class to ensure maximum understanding of the content. In debriefing, use the following questions: • How did you find the answers to the prompts? • Why did the final prompt that asked for one thing take more thinking? • Why is it important to be able to answer questions like these? Listen for: • Lower level prompts can be answered with just locating information. • Higher levels require some inference or combining information. • If you do not understand the processes and possible outcomes before starting, errors may occur.

Program Strategy:	Literacy Strategy:
After students answer the prompts individually, have them share with a partner or team to confirm their answers. Follow with a whole-class discussion to clarify any misconceptions. Students can submit their answers as an exit slip for formative assessment.	

Instructor's Script – 3-2-1

3-2-1 gives students a scaffold to identify what is important to know.

Common Mistakes Made by Students

Students often expect to be able to answer questions by quick reading and looking for key words. If 3-2-1 prompts are constructed properly, students will need to make inferences and may have to re-read information to answer the two higher levels of questions. They must still give answers that are grounded in the text.

CTE Instructor's Extended Discussion

Many masonry projects and procedures are completed by following step-by-step procedures. Students need to learn to follow these steps precisely and efficiently. Measurements must be carefully done. Students often need additional training on measurements using rulers and/or carpenter's squares. The 3-2-1 strategy provides support for identifying key information to be able to complete these tasks.

Students also need to identify possible outcomes. Perfect corners are difficult to construct, but are fundamental to a well-constructed form and slab.

Sample Questions

Career and Technical Concepts

Question	Answer

Read the paragraph below and answer the question that follows:
 	
Once the slab is square, pound a nail in each corner and run a string around the perimeter of the slab forms. Use the string to straighten the forms while staking the rest of the boards. Hammer a stake every 4 to 5 feet to keep the forms straight when you pour the concrete for the slab.
 	
If you were asked to identify three steps in the process, which one would NOT be included?
   A. Pound a nail in each corner
   B. Hammer a stake every 4 to 5 feet
   C. Square the slab
   D. Run a string around the perimeter
	C. Square the slab

PA Core Reading Concepts

Question	Answer

Read the information below and answer the question that follows:
Accuracy refers to the closeness of a measured value to a standard or known value. For example, if in lab you obtain a weight measurement of 3.2 kg for a given substance, but the actual or known weight is 10 kg, then your measurement is not accurate. In this case, your measurement is not close to the known value.
 	
How could the described inaccurate measurement impact the experiment?
   A. Results will not be correct.
   B. New measurement tools need to be found.
   C. The experiment needs to be scrapped.
   D. The standards need to be changed.
	A. Results will not be correct.