



**International Center
for Leadership
in Education**



Gold Seal Lesson:

Copernicus Education Gateway

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<i>Grade Span</i>			<i>ICLE Application Model</i>			
<i>K-4</i>	<i>5-8 XX</i>	<i>9-12 XX</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D XX</i>

Instructional Focus:

Number Operation and Concepts

Students use number, number sense, and number relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Geometry

Students apply geometric concepts, properties, and relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Tools and Technology

Students use appropriate tools and technologies to model, measure, and apply the results in a problem-solving situation. Students communicate the reasoning used in solving these problems.

Problem-Solving and Mathematical Reasoning

Students apply a variety of problem-solving strategies to investigate and solve problems from across the curriculum as well as from practical applications.

Performance Task

Edgardo is in charge of the “chocolate ball” candy division for a candy manufacturer. The chocolate balls are made in vats 6 feet by 8 feet. The height of the chocolate mix, from which the balls are made, is maintained at 3 feet in the vat. The balls will be formed from the mix in the vats. Assume that approximately 95% of the mixture in the vat will be used to make the chocolate balls, which are 1.25 inches in diameter. The chocolate balls made from the mix will be packed in bags containing 80 balls each. Edgardo needs to have a minimum of 10,000 bags produced every two hours. How many vatfuls of chocolate mix will he need to make each two hours? You should use your calculator in the solution of this problem. Round off numbers as appropriate. Show all work and justify your final answer.

ICLE Essential Skills

Perform *operations with signed* (positive and negative) *numbers*, including decimals, ratios, percents, and fractions (m1)

Use the technique of *dimensional analysis* to convert units of measure (e.g., convert km/hr to m/min) including drawing to scale and applying ratios. Understand and use various techniques for estimating, making and converting measure; and using these to perform dimensional analysis (m33)

Compute the *volume of three-dimensional figures* (solids). (m17)

Understand the *properties of circles* (e.g., radius, arc, diameter, chord, secant, tangent, etc.) (m10)

Scoring Guide:

- 4 The student completes the task without any assistance. His/her computation is error free. Dimensional analysis is used to get all measures in the same unit. The student demonstrates an understanding of volume and how it is applied in this particular problem. He/she rounds appropriately, enabling him/her to compute with decimals and large numbers. A clear and logical plan to solve the problem is implemented, demonstrating that the student is able to develop a strategy to solve a complex problem. The student is able to clearly justify his/her solution.
- 3 The student needs a little assistance to complete the task. His/her computation may contain a few minor errors. The student has some difficulty using dimensional analysis to get all measures in the same unit. The student demonstrates an understanding of volume and how it is applied in this particular problem. He/she rounds appropriately, enabling him/her to work with decimals and large numbers. The approach to the problem lacks some clarity and is somewhat difficult to follow, indicating that the student has difficulty developing a plan to solve the problem, demonstrating that the student is not certain about developing a strategy to solve a complex problem. The student's justification of his/her solution is not clearly shown.
- 2 The student needs considerable assistance to complete the task. His/her computation contains several errors. The student ignores the different units in the problem and does not make use of dimensional analysis to change units so that they agree. The student demonstrates some understanding of volume, but has difficulty applying it in this particular problem. He/she has difficulty rounding, making it difficult to work with the decimals and large numbers in this problem. The approach to solving the problem is unclear and vague, indicating that the student does not have the facility to develop a plan to solve the problem. This demonstrates that the student does not know how to develop a strategy to solve a complex problem. The student does not provide an adequate justification of his/her solution.
- 1 Even with considerable assistance, the student is unable to complete the task. His/her computation contains numerous errors. The student ignores the different units in the problem and does not make use of dimensional analysis to change units so that they agree. His/her work is poorly organized and difficult to follow. The student demonstrates only minimal understanding of volume, and is unable to apply it in this particular problem. He/she demonstrates little understanding of rounding numbers and how to work with decimals and large. The approach to solving the problem is unclear and vague, indicating that the student does not have the facility to develop a plan to solve the problem. This demonstrates that the student does not know how to develop a strategy to solve a complex problem. The student does not provide an adequate justification of his/her solution.

Keywords

English Language Arts	Mathematics	Science
Reading	Algebra Computation Cost Analysis Decimals	Earth Science
Writing	Geometry Calculators Circles Problem Solving Sphere Technology Three-Dimensional Objects Volume	Life Science
Communications	Statistics	Chemistry
Literature	Calculus	Physics
Other	Trigonometry	Other
	Other Justification of Answers	