

		Score and Description->	0 (includes blank)	1	2	3
GRADE 10 Q3 ASSESSMENT KEY 0708 1 C D32 2 C D42 3 B D43 4 B D40 5 D D41 6 D DINQ1 7 B DINQ2 8 D DINQ6 9 C DINQ8 10 A DINQ5 GRADE 10 Q3 OPEN ENDED QUESTIONS SCORING RUBRIC	Question	CT State Standard	<p>The response, although may be on topic, is an unsatisfactory answer to the question. It may fail to address the question, or it may address the question in a very limited way.</p> <p>There may be no evidence of elaboration, extension, higher-order thinking, or relevant prior knowledge. There may be evidence of serious misconceptions</p>	<p>This response is a marginal answer to the question. While it may contain some elements of a proficient response, it is inaccurate, incomplete, and/or inappropriate. There is little if any evidence of elaboration, extension, higher-order thinking or relevant prior knowledge. There may be evidence of significant misconceptions.</p>	<p>This response is a proficient answer to the question. It is generally correct, complete, and appropriate although minor inaccuracies may appear. There may be limited evidence of elaboration, extension, higher-order thinking, and relevant prior knowledge, or there may be significant evidence of these traits but other flaws (e.g., inaccuracies, omissions, and inappropriateness) may be more than minor.</p>	<p>This response is an excellent answer to the question. It is correct, complete, and appropriate and contains elaboration, extension, and/or evidence of higher-order thinking and relevant prior knowledge. There is no evidence of misconceptions. Minor errors will not necessarily lower the score.</p>
61	<p>What are the variables that should have been controlled or kept constant in the experiment? Explain why it is important to control variables in an experiment.</p>	<p>DINQ5. Identify independent and dependent variables, including those that are kept constant and those used as controls.</p>	<p><i>States no constants needed, or all variables incorrect.</i></p>	<p><i>Misidentifies one of the variables. Only some constant properties correctly identified, or no explanation as to the reason for controlling variables.</i></p>	<p><i>Identifies both variables: Independent variable: temperature, dependent variable: height of CO2 bubble. Lists some important properties to keep constant., some explanation of need for constants</i></p>	<p><i>Identifies both variables correctly, Lists most properties to keep constant: size of gas collection tube, how mixed, type of tube, light, amounts/type of molasses, etc... Discusses reason for controlling variables as knowing the cause for the effect, referring to making a valid conclusion</i></p>

62	<p>a) What conclusion can be drawn from the students' experiment and results?</p> <p>b) Describe two ways the students could have improved their experimental design and/or validity of their results.</p>	<p>DINQ9. Articulate conclusions and explanations based on research data, and assess results based on the design of the investigation.</p> <p><i>Possible Correct Responses:</i></p> <p><i>Conclusions:</i></p> <ul style="list-style-type: none"> • CO₂ production in yeast increases with increasing temperature. • CO₂ production in yeast decreases with decreasing temperature. <p><i>Improvements:</i></p> <ul style="list-style-type: none"> • The students could repeat the experiment to verify their results or do multiple trials at each temperature and average their results. • The students could add additional trials at higher (and/or lower) temperatures to see if the trend holds. • The students could perform the test again at smaller temperature increments. • The students could use a warming oven for the test tube subjected to room temperature (25°C), because in 24 hours, temperatures could fluctuate a few degrees which could affect results. • The students should use a consistent size for the gas collection tube (not clear in procedure). • Other acceptable responses. 	<p><i>The response describes little or no accurate or relevant information.</i></p>	<p><i>The response provides a valid conclusion but fails to accurately describe a way the students could improve their experimental design and/or the validity of their results.</i></p> <p><i>-or-</i></p> <p><i>The response describes one way the students could improve their experimental design and/or the validity of their results but fails to provide a valid conclusion.</i></p>	<p><i>The response provides a valid conclusion and describes one way the students could improve their experimental design and/or the validity of their results.</i></p> <p><i>-or-</i></p> <p><i>The response describes at least two ways the students could improve their experimental design and/or the validity of their results but fails to provide a valid conclusion.</i></p>	<p><i>The response provides a valid conclusion and describes at least two ways the students could improve their experimental design and/or the validity of their results.</i></p>
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63	<p>The class then decides to investigate whether different concentrations of molasses affect the RATE of CO₂ production. Write a step-by-step procedure you could use to collect reliable data related to your question. Include enough detail so that someone else could conduct the same experiment and get similar results</p>	<p>DINQ4 Design and conduct appropriate types of scientific investigations to answer different questions.</p>	<p><i>Describes an experiment without mentioning concentration of molasses</i></p>	<p><i>Describes an experiment with independent variable of different concentration, may not mention keeping same type of molasses and yeast, and may generally describe method to measure CO₂</i></p>	<p><i>Describes an experiment with independent variable of different concentration using same materials, and describes method to measure CO₂ rate(time) as dependent. May not address any other design concerns.</i></p>	<p><i>Describes an experiment with independent variable of different concentration using the same materials, equipment, and describes method to measure CO₂ rate as dependent. Describes some of controlling variables, multiple trials, control group.</i></p>
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64.	<p>Doctors need to be careful not to give their patients an antibiotic such as penicillin too often. If the same antibiotic is prescribed too many times, it can become less effective against bacteria. Explain fully why this is so.</p>	<p>DINQ10 Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.</p> <p>This item assesses students' understanding of the evolution of a species in the context of bacteria becoming resistant to an antibiotic over time. The phenomenon described occurs because each time the antibiotic is used, some of the bacteria survive. They survive because there is variation within the species, and some bacteria are resistant to the antibiotic. The surviving bacteria will reproduce to produce bacteria that are also resistant to the antibiotic. In this way, over many generations the bacteria will become more resistant to the antibiotic.</p>	<p><i>A 0 response may show an incorrect explanation or major misconceptions. Misconceptions may be present.</i></p>	<p><i>A 1 response may show some explanation of antibiotics, but not the resistance over time. It contains limited or no elaboration. Misconceptions may be present.</i></p>	<p><i>A 2 response may indicate some misconceptions (stronger penicillin will be better) or be much less elaborated. It is somewhat elaborated and contains little misconceptions.</i></p>	<p><i>A 3 response is correct complete and elaborated. It includes the ideas about resistance, variation within the species, as well as the evolutionary ideas about bacteria.</i></p>
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