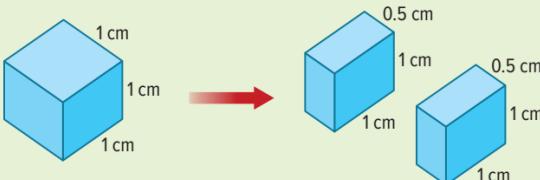


Grade 8 Advanced Science EOT3 Example Questions

1.	 Get It? Explain the law of conservation of mass.
2.	 Get It? Summarize Describe the purpose of coefficients in a chemical equation.
3.	 Get It? Summarize How can you tell whether a chemical equation is balanced or not?
4.	1. Balance this equation: $\text{MgCl}_2(\text{aq}) + \text{AgNO}_3(\text{aq}) \rightarrow \text{Mg}(\text{NO}_3)_2(\text{aq}) + \text{AgCl}(\text{s})$.
5.	5. Identify the reactants and the products in the following chemical equation. $\text{Cd}(\text{NO}_3)_2(\text{aq}) + \text{H}_2\text{S}(\text{g}) \rightarrow \text{CdS}(\text{s}) + 2\text{HNO}_3(\text{aq})$
6.	How many molecules are in 1 mol of H_2O ?
7.	EXAMPLE Problem 1 BALANCE EQUATIONS A sample of barium sulfate (BaSO_4) is placed on a piece of paper, which is then ignited. Barium sulfate reacts with the carbon (C) from the burned paper, producing barium sulfide (BaS) and carbon monoxide (CO). Write a balanced equation for this reaction.
8.	 Get It? Summarize Describe what happens in a single-displacement reaction.
9.	 Get It? Classify What kind of reaction produces a precipitate?
10.	12. Characterize each reaction by determining its reaction type. a. $\text{CaO}(\text{s}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{Ca}(\text{OH})_2(\text{aq})$ b. $\text{Fe}(\text{s}) + \text{CuSO}_4(\text{aq}) \rightarrow \text{FeSO}_4(\text{aq}) + \text{Cu}(\text{s})$ c. $\text{C}_{10}\text{H}_8(\text{l}) + 12\text{O}_2(\text{g}) \rightarrow 10\text{CO}_2(\text{g}) + 4\text{H}_2\text{O}(\text{g})$ d. $\text{NaCl}(\text{aq}) + \text{AgNO}_3(\text{aq}) \rightarrow \text{NaNO}_3(\text{aq}) + \text{AgCl}(\text{s})$ e. $\text{NH}_4\text{NO}_3(\text{s}) \rightarrow \text{N}_2\text{O}(\text{g}) + 2\text{H}_2\text{O}(\text{g})$

11.	13. Describe what happens in a combustion reaction.
12.	 Get It? Infer Why is a log fire considered to be an exothermic reaction?
13.	19. Classify the chemical reaction photosynthesis as endergonic or exergonic. Explain.
14.	23. Apply To develop a product that warms people's hands, would you use an exothermic or endothermic reaction? Why?
15.	 Get It? Use the collision model to explain the effect of increased temperature on reaction rates.
16.	 Get It? Compare and contrast the effects of increased concentration of liquid reactants and decreased volume of gaseous reactants.
17.	 Get It? Compare and contrast catalysts and inhibitors in terms of how they affect reaction rates.
18.	 Get It? Contrast the forward and reverse reactions in a reversible reaction.
19.	26. List four ways to change the rate of a chemical reaction.
20.	27. Describe two ways in which you might state the rate of a chemical reaction.
21.	30. Apply Describe two ways you could influence the following equilibrium to produce more ethanal (CH_3CHO). Use Le Châtelier's principle to explain why each of your methods would produce the desired result. $\text{C}_2\text{H}_2(\text{g}) + \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{CH}_3\text{CHO}(\text{g}) + \text{energy}$

22.	 Get It? Explain How do you know which substance is the solute in a solution?
23.	 Get It? Identify where a solid actually dissolves when placed in a liquid.
24.	EXAMPLE Problem 1 CALCULATE SURFACE AREA Suppose the length, height, and width of a cube are each 1 cm. If the cube is cut in half to form two rectangular pieces, what is the total surface area of the new pieces? 
25.	1. The length, height, and width of a cube are each 3 cm. If the cube is cut in half to form two rectangular pieces, what is the total surface area of the new pieces?
26.	4. Summarize possible ways in which phases of matter could combine to form a solution.
27.	5. Draw a diagram that shows how a solid dissolves in a liquid.
28.	6. Describe how stirring, surface area, and temperature affect the rate of dissolving.
29.	 Get It? Explain What is solubility?

30.



Rank the solubilities of salt, washing soda, and table sugar in water at 20°C from most soluble to least soluble using the information in **Table 1**.

Table 1 Solubility in Water at 20°C and Normal Atmospheric Pressure

State of Substance	Substance	Solubility in g/100 g of Water
Solid	salt (sodium chloride)	35.9
	baking soda (sodium bicarbonate)	9.6
	washing soda (sodium carbonate)	21.4
	lye (sodium hydroxide)	109.0
	table sugar (sucrose)	203.9
Gaseous	hydrogen	0.00017
	oxygen	0.005
	carbon dioxide	0.16

31.



Explain how the temperature of a liquid solvent affects the solubility of a compound.

32.



Explain why the term *unsaturated* is not precise.

33.

10. **Contrast** What is the difference between solubility and concentration?

34.

11. **Compare and contrast** the difference between relative and precise concentrations. Give examples.

35.

12. **Explain** Do all solutes dissolve to the same extent in the same solvent? How do you know?

36.

14. **Explain** why keeping a carbonated beverage capped and refrigerated helps keep it from going flat.

37.



Compare and Contrast What are the differences and similarities between dissociation and ionization?

38.



Get It?

Summarize Why is soap required to clean oily dirt?

39.

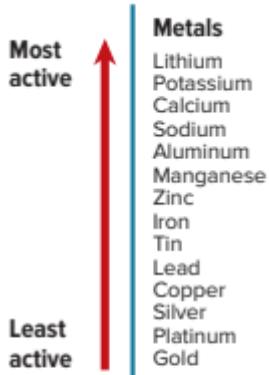


Figure 10 An activity series is a useful tool for determining whether a chemical reaction will occur and for determining the result of a single-replacement reaction.

15. Determine, using **Figure 10**, if zinc will displace gold in a chemical reaction and explain why or why not.

40.

20. Explain why the total amount of energy does not decrease in an exergonic chemical reaction.

41.

21. Explain how a reaction could be endergonic but not endothermic.

42.

22. Classify the reaction that makes a firefly glow in terms of energy input and output.

43.

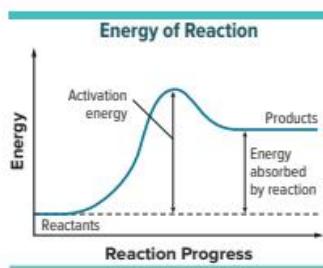


Figure 17 Baking involves endothermic reactions such as the decomposition of baking soda. The graph shows how energy is absorbed during these chemical reactions.

Compare How did the cookies change when they were baked?