Name: _____ **Date:** _____

Section: _____

Yeast Respiration Activity

How Yeast Make Energy (With and Without Oxygen!)

Phase 1: ENGAGE (8 minutes)

Getting Started: Open peebedu.com and navigate to Yeast Respiration Simulator

First Look: What can you control in this simulation? _____

- Yeast type: _____

- Temperature: _____

Look at the beaker - what do you see? _____

Think About It: Why does bread dough rise? What gas do you think yeast produce?

Essential Question: How do cells make ATP when oxygen runs out? _____

Phase 2: EXPLORE (18 minutes)

Mission 1: Oxygen Makes a Difference

Setup: Baker's yeast, glucose, 25°C

Part A - With Oxygen (Open Vessel): Run for 30 seconds and record:

- Which pathway is most active? _____

- Do you see ethanol forming? Yes / No

Part B - Without Oxygen (Sealed Vessel): Seal the vessel and watch for 60 seconds:

- —— 100%

Discovery: What happens when oxygen runs out? _____

Mission 2: Temperature Effects

Use Champagne yeast with glucose, seal vessel immediately:

Test three temperatures and record peak rates:

- ————

——— Speed

Critical Thinking:

Why don't your cells make ethanol like yeast during exercise?

Exit Reflection:

Rate your understanding (1-5 stars):

- How cells make ATP:
- When fermentation occurs:
- Environmental effects:

One surprising thing I learned: _____

Key Terms to Remember:

- **Glycolysis:** Breaking glucose into smaller pieces
- **Aerobic:** With oxygen
- **Anaerobic:** Without oxygen
- **Fermentation:** Making ATP without oxygen
- **ATP:** Cell's energy currency
- **Substrate:** Food molecule for cells
- **Ethanol:** Alcohol product of fermentation