Yeast and dough expansion

Teacher / technician

YEAR 10 / LESSON 23 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Dough expansion is a gas-retention proxy; the open setup does not establish exclusively anaerobic respiration.

Coverage and delivery

Shared Biology / Double Award: 5.5–5.6. Yeast in food production and changing conditions.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Student booklets / graph sheets	1 per learner	30 of each
Dough ingredients	25 g flour + 1 g sugar + 30 cm^3 liquid per portion	450 g flour; 18 g sugar; 7 g yeast in 450 cm^3 water; 90 cm^3 control water, plus spares
Graduated vessels / timers	1 of each per pair	15 plus 3 control vessels
Temperature stations	20, 30 and 37 °C	3 stations; verified thermometers
No-yeast dough	matching control at each temperature	3 equal portions

Immediate safety

Do not eat classroom dough. Check wheat/gluten and yeast sensitivities; avoid flour dust. Clean spills promptly and keep vessels unsealed so pressure cannot build. Wash hands and benches after handling dough.

Preparation and delivery

Read alongside the student method

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1. Per portion use 25 g flour, 1 g sugar and 30 cm^3 yeast suspension. Prepare fresh suspension using 7 g dried baker's yeast in 450 cm^3 warm water, checking the product and pilot. For 15 test portions plus three no-yeast controls, provide 450 g flour, 18 g sugar, 450 cm^3 suspension and 90 cm^3 plain water for controls; allow spare materials. Mix each portion identically and promptly, replacing suspension with water only in controls.

2. Allocate five pairs to each temperature. Standardise portion mass and initial mixing; use vessels with ample headroom and prevent water-bath water entering the dough.

3. Pilot the yeast batch and 30-minute interval. Provide the no-yeast controls at each temperature and record actual temperatures rather than nominal settings. Check allergies and avoid airborne flour.

Close of lesson

- Place dough in the designated solid-waste container, not the sink.
- Wash equipment as directed and clean hands and work surfaces.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- Baker’s yeast, a fungus.
- Carbon dioxide.
- Recipe, starting amount, yeast batch, vessel shape, mixing and elapsed time.
- It checks expansion or physical changes occurring without added yeast.
- 18 cm^3, or 45% of the initial volume.
- Some gas escapes or dissolves, and dough structure affects retention; volume is a proxy.

References and provenance

Pearson Biology specification

RSC: yeast and expansion of bread dough

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.