

ACT Science Practice Paper 1

Full Section Simulation

40 Questions · 35 Minutes

How to use this booklet

- This is a full-length ACT Science section simulation: 40 questions in 35 minutes.
- There are 6 passages: 2 Data Representation, 3 Research Summaries, and 1 Conflicting Viewpoints.
- Read each passage, then answer the questions that follow using only the information given.
- You may refer back to a passage as often as needed.
- No outside scientific knowledge beyond common background is required.

Exhibit 2: Enzyme P Reaction Rate vs. Substrate Concentration (at 40°C)

Substrate Concentration (mM)	Reaction Rate at 40°C (units/min)
1	6
2	12
4	22
8	28
16	29
32	29

1. According to Table 1, at which temperature did Enzyme P show its maximum activity?

- A 50°C
- B 40°C
- C 30°C
- D 60°C

2. Based on Table 1, as temperature increases from 10°C to 40°C, the activity of Enzyme Q:

- A increases only
- B decreases only
- C increases, then decreases
- D stays constant

3. Using Table 1, at approximately what temperature do Enzyme P and Enzyme Q have the same activity?

- A Between 30°C and 40°C
- B Between 40°C and 50°C
- C Between 20°C and 30°C
- D Between 10°C and 20°C

4. According to Table 2, over what interval of substrate concentration does the reaction rate increase most steeply?

- A 8 mM to 16 mM
- B 2 mM to 4 mM
- C 16 mM to 32 mM
- D 1 mM to 2 mM

5. Table 2 shows that the reaction rate plateaus at high substrate concentrations. This plateau most likely indicates that:

- A the pH has become too acidic
- B the substrate has been fully consumed
- C all enzyme active sites are saturated with substrate

D the enzyme has denatured

6. A student claims Enzyme Q would be a better choice than Enzyme P for an industrial process run at 55°C. Do the data in Table 1 support this claim?

- A Yes, because Q's activity is higher than P's at every listed temperature
- B Yes, because at 60°C, Q (40) is much higher than P (8)
- C No, because activity was not measured at exactly 55°C
- D No, because P has a higher activity than Q at every listed temperature

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ACT SCIENCE — ANSWER KEY

Answers & worked solutions

Answer Key

1	B	2	A	3	B	4	B	5	C	6	B	7	B	8	D
9	C	10	A	11	D	12	C	13	C	14	A	15	D	16	C
17	D	18	B	19	D	20	A	21	A	22	B	23	A	24	C
25	B	26	B	27	C	28	B	29	B	30	C	31	B	32	A
33	D	34	B	35	C	36	C	37	C	38	A	39	C	40	B

Passage I — Enzyme Activity and Temperature

1. According to Table 1, at which temperature did Enzyme P show its maximum activity? [Data Rep: Read a table maximum]

Correct answer: B

- Scan the Enzyme P column in Table 1 for the highest value: 30 units/min occurs at 40°C, higher than at any other listed temperature.

KEY TAKEAWAY

When a question asks for a maximum or minimum, scan the entire column methodically rather than trusting your first impression — the highest value isn't always at the extreme ends of the table.

2. Based on Table 1, as temperature increases from 10°C to 40°C, the activity of Enzyme Q: [Data Rep: Trend identification]

Correct answer: A

- Enzyme Q values from 10°C to 40°C: 2, 6, 14, 24 — each value is larger than the last, so activity increases only over this range.

KEY TAKEAWAY

A trend only holds over the exact range stated in the question — always re-check the specific rows the question asks about, not the whole table.

3. Using Table 1, at approximately what temperature do Enzyme P and Enzyme Q have the same activity? [Data Rep: Interpolation between rows]

Correct answer: B

- At 40°C, P=30 and Q=24 (P higher). At 50°C, P=18 and Q=34 (Q higher).
- Since the P and Q values swap order between these two temperatures, the curves must cross somewhere between 40°C and 50°C.