# Math for Coding & Games

Ages 10-12 | Digital Explorers

Use math to move characters, design fair rewards, and create game patterns.

## How to use this guide

Read each section, complete its four lab steps, then answer the questions in the online course. The online progress bar advances only after four correct answers.

## Section 1: Coordinates

LEARNING GOAL: Coordinates. Your finished work should demonstrate: A coordinate-grid game map with a tested path.

EXPLAIN THE CONCEPT: A coordinate pair tells you where a point is on a grid. The first number moves across the x-axis and the second moves up the y-axis. Games use coordinates to place characters and objects. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.

ORIGINAL PROJECT LAB: 1. Draw a grid from 0 to 5 on each axis. 2. Plot a player at (1, 2) and a goal at (4, 5). 3. Write three moves that take the player to the goal. 4. Test each move on the grid and correct any wrong location. Finished result: A coordinate-grid game map with a tested path.

EXPLAIN THE MECHANISM: A coordinate pair identifies position, with horizontal x first and vertical y second. On our paper grid, x increases right and y increases up. Changing the order usually changes the point. State the grid’s direction rules before comparing it with a screen or game that may use different conventions.

WORKED CASE: On a grid numbered 0 to 5, start at (1,2). Right three gives (4,2); up two gives (4,4); up one gives (4,5). That is three commands but six unit steps. Plot (2,1) separately to show why reversing the starting pair would change the route.

TEST AND JUSTIFY: Trace every endpoint before running the next command. Compare the intended final point with the actual trace. Keep the start and axis directions fixed while testing a changed command. Explain why counting commands alone does not tell you how far the character traveled.

GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.

SAFETY CHECK: Use unique passphrases, recognize scams, protect privacy, behave

respectfully, and pause before sharing. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.

REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.

PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: A coordinate-grid game map with a tested path.

## Investigate with pictures and choices

A character at (1, 2) moves three units right.

What is the new position?

1. (1, 5)
2. (3, 3)
3. (4, 2)

## Worked reasoning

Answer: (4, 2). Right changes the horizontal coordinate by +3 and leaves the vertical coordinate unchanged.

## Try a changed example

Move two units down and predict the new pair.

## Picture and meaning matches

Coordinates: Locate a point

Fraction: Compares a part with its whole

Pattern rule: Predicts the next value

## Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool. A helper can operate the controls while you choose.

## Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed. Choose this foundation practice only when it fits the learner goal.

My notes: _____

## Hands-on lab

1. Draw a grid from 0 to 5 on each axis.
2. Plot a player at (1, 2) and a goal at (4, 5).
3. Write three moves that take the player to the goal.
4. Test each move on the grid and correct any wrong location.

Finished result: A coordinate-grid game map with a tested path.

## Check your understanding

1. Which idea best describes Coordinates?

A. It has no purpose in this project.

B. A fraction describes part of a whole.

C. A coordinate pair tells you where a point is on a grid.

D. A pattern follows a rule.

2. What is the first step in this lab?

A. Test each move on the grid and correct any wrong location.

B. Plot a player at (1, 2) and a goal at (4, 5).

C. Write three moves that take the player to the goal.

D. Draw a grid from 0 to 5 on each axis.

3. What should you do after step two?

A. Write three moves that take the player to the goal.

B. Plot a player at (1, 2) and a goal at (4, 5).

C. Test each move on the grid and correct any wrong location.

D. Draw a grid from 0 to 5 on each axis.

4. Which result shows that your lab is finished?

A. A blank page with no work

B. A coordinate-grid game map with a tested path.

C. A copied answer without checking it

D. A skipped lab

## Answer review

1. C. A coordinate pair tells you where a point is on a grid.
2. D. Start with: Draw a grid from 0 to 5 on each axis.
3. A. Step three is: Write three moves that take the player to the goal.
4. B. The goal is: A coordinate-grid game map with a tested path.

## Section 2: Fractions & percentages

LEARNING GOAL: Fractions & percentages. Your finished work should demonstrate: Two correctly labeled health-bar percentages.

EXPLAIN THE CONCEPT: A fraction describes part of a whole. A percentage describes that part out of 100. Game designers use them to show health, progress, and the chance of rewards. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.
ORIGINAL PROJECT LAB: 1. Draw a health bar divided into ten equal boxes. 2. Shade seven boxes and write 7/10. 3. Convert 7/10 to 70% by thinking of 70 out of 100. 4. Remove two shaded boxes and calculate the new percentage. Finished result: Two correctly labeled health-bar percentages.
EXPLAIN THE MECHANISM: A fraction describes a share of a specified whole. Percent means per hundred. Equal-size cells make a bar a useful model because each cell represents the same share. If you change the whole, you must reconsider what each cell means.
WORKED CASE: Shade seven of ten equal cells: 7/10 = 70%. Remove two shaded cells: 5/10 = 50%. The drop is twenty percentage points. It is not a twenty-percent relative decrease from the original seven shaded cells; that comparison uses a different starting whole.
TEST AND JUSTIFY: Draw both bars with the same ten-cell total. Label shaded count, fraction, and percentage. Explain why seven shaded cells out of fourteen would be 50%, unlike seven out of ten. Use the denominator to identify the whole before calculating.
GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.
SAFETY CHECK: Use unique passphrases, recognize scams, protect privacy, behave respectfully, and pause before sharing. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.
REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.
PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: Two correctly labeled health-bar percentages.

## Investigate with pictures and choices

Three of twelve game tokens are blue.

What fraction is blue?

1. 12/3
2. 3/12 = 1/4
3. 3/9

## Worked reasoning

Answer: 3/12 = 1/4. Use all twelve tokens as the denominator. Three out of twelve simplifies to one quarter.

## Try a changed example

Represent the same part with counters and a divided rectangle.

## Picture and meaning matches

Coordinates: Locate a point

Fraction: Compares a part with its whole

Pattern rule: Predicts the next value

## Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.

A helper can operate the controls while you choose.

## Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed.

Choose this foundation practice only when it fits the learner goal.

My notes: _____

## Hands-on lab

1. Draw a health bar divided into ten equal boxes.
2. Shade seven boxes and write 7/10.
3. Convert 7/10 to 70% by thinking of 70 out of 100.
4. Remove two shaded boxes and calculate the new percentage.

Finished result: Two correctly labeled health-bar percentages.

## Check your understanding

1. Which idea best describes Fractions & percentages?

A. It has no purpose in this project.

B. A coordinate pair tells you where a point is on a grid.

C. A fraction describes part of a whole.

D. A pattern follows a rule.

2. What is the first step in this lab?

A. Remove two shaded boxes and calculate the new percentage.

B. Shade seven boxes and write 7/10.

C. Convert 7/10 to 70% by thinking of 70 out of 100.

D. Draw a health bar divided into ten equal boxes.

3. What should you do after step two?

A. Convert 7/10 to 70% by thinking of 70 out of 100.

B. Shade seven boxes and write 7/10.

C. Remove two shaded boxes and calculate the new percentage.

D. Draw a health bar divided into ten equal boxes.

4. Which result shows that your lab is finished?

A. A blank page with no work

B. Two correctly labeled health-bar percentages.

C. A copied answer without checking it

D. A skipped lab

## Answer review

1. C. A fraction describes part of a whole.

2. D. Start with: Draw a health bar divided into ten equal boxes.

3. A. Step three is: Convert 7/10 to 70% by thinking of 70 out of 100.

4. B. The goal is: Two correctly labeled health-bar percentages.

## Section 3: Patterns

LEARNING GOAL: Patterns. Your finished work should demonstrate: A game-level pattern with a clear rule and prediction.

EXPLAIN THE CONCEPT: A pattern follows a rule. Finding the rule helps you predict the next item and create repeatable game levels. A loop in code can follow the same rule. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.

ORIGINAL PROJECT LAB: 1. Write the sequence 2, 4, 6, 8. 2. Describe the rule and predict the next two numbers. 3. Make a level plan where obstacles appear at those positions. 4. Ask a partner to test your rule and explain it. Finished result: A game-level pattern with a clear rule and prediction.

EXPLAIN THE MECHANISM: A pattern needs a stated rule and a boundary. A few numbers may fit more than one invented rule, so do not claim there is only one possible continuation unless the rule is given. A loop can repeat the chosen rule while checking its stopping condition.
WORKED CASE: Use a separate strip numbered 0 to 12. Under the add-two rule, positions 2, 4, 6, 8 continue to 10 and 12. The next position would be 14, outside the strip. The boundary rule stops a new placement there.
TEST AND JUSTIFY: List the last valid position and the first invalid position. Test what happens when the level length changes to 10. Position 10 remains valid, but 12 no longer fits. Explain the sequence rule separately from the boundary rule.
GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.
SAFETY CHECK: Use unique passphrases, recognize scams, protect privacy, behave respectfully, and pause before sharing. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.
REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.
PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: A game-level pattern with a clear rule and prediction.

## Investigate with pictures and choices

The scores are 4, 7, 10, 13.

What follows if the rule is add three?

1. 16
2. 15
3. 26

## Worked reasoning

Answer: 16. Each difference is three. Apply the stated rule once more.

## Try a changed example

Invent a different rule and state it before predicting.

## Picture and meaning matches

Coordinates: Locate a point

Fraction: Compares a part with its whole

Pattern rule: Predicts the next value

## Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.

A helper can operate the controls while you choose.

## Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed.

Choose this foundation practice only when it fits the learner goal.

My notes: _____

## Hands-on lab

1. Write the sequence 2, 4, 6, 8.
2. Describe the rule and predict the next two numbers.
3. Make a level plan where obstacles appear at those positions.
4. Ask a partner to test your rule and explain it.

Finished result: A game-level pattern with a clear rule and prediction.

## Check your understanding

1. Which idea best describes Patterns?

A. A coordinate pair tells you where a point is on a grid.

B. A pattern follows a rule.

C. A fraction describes part of a whole.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Describe the rule and predict the next two numbers.

B. Make a level plan where obstacles appear at those positions.

C. Write the sequence 2, 4, 6, 8.

D. Ask a partner to test your rule and explain it.

3. What should you do after step two?

A. Describe the rule and predict the next two numbers.

B. Ask a partner to test your rule and explain it.

C. Write the sequence 2, 4, 6, 8.

D. Make a level plan where obstacles appear at those positions.

4. Which result shows that your lab is finished?

A. A game-level pattern with a clear rule and prediction.

B. A copied answer without checking it

C. A skipped lab

D. A blank page with no work

## Answer review

1. B. A pattern follows a rule.

2. C. Start with: Write the sequence 2, 4, 6, 8.

3. D. Step three is: Make a level plan where obstacles appear at those positions.

4. A. The goal is: A game-level pattern with a clear rule and prediction.

## Section 4: Guided Project & Worked Examples

COURSE INVESTIGATION: Compare scoring rules fairly

YOUR PRACTICE INPUT: Three pretend players finish 8, 6, and 4 tasks. Rule A awards five points per task; rule B awards two points per task plus a 20-point completion bonus for all eight tasks.

WHY IT WORKS: Rule A scores are 40, 30, and 20. Rule B scores are 36, 12, and 8. The ranking stays the same, but the gaps change.

PLAN BEFORE YOU ACT: Draw or write the starting state, the question you need to answer, and the evidence you expect to see. A paper trace is acceptable; label it as a prediction unless you actually run a test.

WORK THE CASE: Calculate both score tables, plot them on the same scale, and explain which behavior each rule encourages.

COMPARE WITH THE EXPECTED RESULT: The comparison preserves the same player results and states the design goal before judging the scoring system.

EXPLAIN YOUR REASONING: Show the connection between the supplied input, each decision, and your result. If a number, label, or observation differs, return to the first differing step rather than changing several things together.

KEEP YOUR EVIDENCE: Save the initial plan, a drawing or sanitized output, and one explanation of what the result does and does not prove. Use pointing, speech, drawing, typing, or your usual communication method.

LEARNING GOAL: Guided Project & Worked Examples. Your finished work should demonstrate: A completed guided project with documented evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

EXPLAIN THE CONCEPT: Review the course concepts through two applied examples. Move a game character on an x/y coordinate grid and predict the new position. Convert a

score such as 18/24 to a fraction, decimal, and percentage. Guided project: Design a grid-based game level using coordinates, distance, fractions/percentages, patterns, and a scoring rule. Work with synthetic or fictional information and ask an adult for help when appropriate. Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.

ORIGINAL PROJECT LAB: 1. Read both worked examples and explain the reasoning. 2. Design a grid-based game level using coordinates, distance, fractions/percentages, patterns, and a scoring rule. 3. Record the steps you completed and the result you observed. 4. Compare your result to the goal and correct one issue. Finished result: A completed guided project with documented evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

EXPLAIN THE MECHANISM: Combine a route, checkpoints, and a score without mixing their units. Use horizontal and vertical unit steps only. Keep a record of what each number counts: coordinates, steps, collected checkpoints, or points. A useful project lets someone reproduce your calculation.

WORKED CASE: Start at (1,2), finish at (4,5), and place checkpoints at (3,2), (4,3), and (4,5). Right three then up three visits all three in six steps. At ten points per checkpoint, the score is thirty. In a separate conversion example, 18/24 = 3/4 = 75%; that does not change the game’s thirty-point total.

TEST AND JUSTIFY: Trace the route and mark each checkpoint when reached. Record expected and observed endpoints. Ask a helper to calculate the score from the checkpoint record rather than guessing from the route drawing. Keep the separate percentage example clearly labeled.

GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.

SAFETY CHECK: Use unique passphrases, recognize scams, protect privacy, behave respectfully, and pause before sharing. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.

REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.

PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing

the goal, your approach, your evidence, and one lesson learned. Expected result: A completed guided project with documented evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

## Investigate with pictures and choices

A game shows 25% energy in a bar.

Which fraction matches it?

1. Three quarters
2. One tenth
3. One quarter

## Worked reasoning

Answer: One quarter. 25 percent means 25 out of 100, equivalent to one quarter.

## Try a changed example

Draw a bar divided into four equal parts.

## Picture and meaning matches

Coordinates: Locate a point

Fraction: Compares a part with its whole

Pattern rule: Predicts the next value

## Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.

A helper can operate the controls while you choose.

## Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed.

Choose this foundation practice only when it fits the learner goal.

My notes: _____

## Hands-on lab

1. Read both worked examples and explain the reasoning.
2. Design a grid-based game level using coordinates, distance, fractions/percentages, patterns, and a scoring rule.
3. Record the steps you completed and the result you observed.

4. Compare your result to the goal and correct one issue.

Finished result: A completed guided project with documented evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

## Check your understanding

1. Which idea best describes Guided Project & Worked Examples?

A. A coordinate pair tells you where a point is on a grid.

B. Review the course concepts through two applied examples.

C. A fraction describes part of a whole.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Design a grid-based game level using coordinates, distance, fractions/percentages, patterns, and a scoring rule.

B. Record the steps you completed and the result you observed.

C. Read both worked examples and explain the reasoning.

D. Compare your result to the goal and correct one issue.

3. What should you do after step two?

A. Design a grid-based game level using coordinates, distance, fractions/percentages, patterns, and a scoring rule.

B. Compare your result to the goal and correct one issue.

C. Read both worked examples and explain the reasoning.

D. Record the steps you completed and the result you observed.

4. Which result shows that your lab is finished?

A. A completed guided project with documented evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

B. A copied answer without checking it

C. A skipped lab

D. A blank page with no work

## Answer review

1. B. Review the course concepts through two applied examples.

2. C. Start with: Read both worked examples and explain the reasoning.

3. D. Step three is: Record the steps you completed and the result you observed.

4. A. The goal is: A completed guided project with documented evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

## Section 5: Independent Challenge & Mastery

INDEPENDENT TRANSFER CASE: Compare scoring rules fairly

KEEP THE ORIGINAL BASELINE: Three pretend players finish 8, 6, and 4 tasks. Rule A

awards five points per task; rule B awards two points per task plus a 20-point completion bonus for all eight tasks.

CHANGE ONE CONDITION: Change the bonus to 50 and compare the score gaps again. A larger gap does not automatically make a game fairer.

YOUR TASK: Calculate both score tables, plot them on the same scale, and explain which behavior each rule encourages.

PREDICT, THEN CHECK: State which part of your original reasoning should remain true and which part must be recalculated or retested. Keep the original and changed results side by side.

REVIEW CRITERIA: The comparison preserves the same player results and states the design goal before judging the scoring system.

MENTOR DISCUSSION: Explain why the changed condition matters. Identify a tempting wrong conclusion, show the observation that would challenge it, and choose one next test. A statement of uncertainty is better than inventing a result.

PORTFOLIO NOTE: Keep your baseline, changed input, prediction, observed or paper-traced result, explanation, and one improvement. These practice prompts do not replace the course's existing quiz or final assessment.

LEARNING GOAL: Independent Challenge & Mastery. Your finished work should demonstrate: An independent demonstration with evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

EXPLAIN THE CONCEPT: Apply what you learned without copying the guided solution. Independent challenge: Balance two scoring systems using sample player results and explain which is fairer. Safety and responsibility: Use fictional player data; never collect classmates' personal information for a math activity. Reflect on your work: What did you build or discover? What did you test or change after feedback? What safe or responsible choice did you make? Think about where you might use this skill in a real or imaginary project. Describe the problem it helps you solve and how you would recognize a successful result.

ORIGINAL PROJECT LAB: 1. Explain the challenge and make a short plan. 2. Balance two scoring systems using sample player results and explain which is fairer. 3. Test the result and record evidence of your work. 4. Review the safety scenario and describe one improvement. Finished result: An independent demonstration with evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test

explanation.
EXPLAIN THE MECHANISM: A scoring rule rewards particular behavior. Compare rules using the same fictional results before deciding which fits your goal. State whether efficiency, completion, or both matter. A design judgment needs a reason as well as arithmetic.
WORKED CASE: A collects three checkpoints in six steps, B three in eight, and C two in four. Ten points per checkpoint gives 30, 30, 20. Add max(0,10 minus steps): totals become 34, 32, 26. If the bonus requires all checkpoints, C instead scores 20.
TEST AND JUSTIFY: Test a twelve-step route: the bonus is zero, not negative two. Explain whether unfinished routes should receive an efficiency bonus and why. Present the formula, three worked calculations, one boundary test, and the reason for your chosen rule.
GO DEEPER: Identify an assumption, test a safe alternative, and explain the trade-off. Keep a short before-and-after record that someone else could follow.
SAFETY CHECK: Use unique passphrases, recognize scams, protect privacy, behave respectfully, and pause before sharing. Use pretend data, never real passwords or private information. Stop and ask a trusted adult if anything seems unsafe.
REVIEW QUESTIONS: What is the main idea? Why does the first step matter? How would you detect a mistake? What evidence proves the result? What would you improve? Answer in your own words before taking the quiz.
PORTFOLIO REFLECTION: Save a drawing, sanitized screenshot, or short note describing the goal, your approach, your evidence, and one lesson learned. Expected result: An independent demonstration with evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

## Investigate with pictures and choices

A counter follows right, right, up from (0, 0).
Where does it end?
1. (3, 0)
2. (2, 1)
3. (1, 2)

## Worked reasoning

Answer: (2, 1). Track one move at a time. Two right moves change x, and one up move

changes y.

## Try a changed example

Change the start to (1, 1) and repeat the same moves.

## Picture and meaning matches

Coordinates: Locate a point

Fraction: Compares a part with its whole

Pattern rule: Predicts the next value

## Ways to respond

Choose, point, draw, demonstrate, type, speak or use your usual communication tool.

A helper can operate the controls while you choose.

## Counting support if useful

Use zero to ten counters or dots. Touch each once. The last count names the quantity. Rearrange the same set and check whether anything was added or removed.

Choose this foundation practice only when it fits the learner goal.

My notes: _____

## Hands-on lab

1. Explain the challenge and make a short plan.
2. Balance two scoring systems using sample player results and explain which is fairer.
3. Test the result and record evidence of your work.
4. Review the safety scenario and describe one improvement.

Finished result: An independent demonstration with evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

## Check your understanding

1. Which idea best describes Independent Challenge & Mastery?

A. It has no purpose in this project.

B. A coordinate pair tells you where a point is on a grid.

C. Apply what you learned without copying the guided solution.

D. A fraction describes part of a whole.

2. What is the first step in this lab?

A. Review the safety scenario and describe one improvement.

B. Balance two scoring systems using sample player results and explain which is

fairer.

C. Test the result and record evidence of your work.

D. Explain the challenge and make a short plan.

3. What should you do after step two?

A. Test the result and record evidence of your work.

B. Balance two scoring systems using sample player results and explain which is fairer.

C. Review the safety scenario and describe one improvement.

D. Explain the challenge and make a short plan.

4. Which result shows that your lab is finished?

A. A blank page with no work

B. An independent demonstration with evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

C. A copied answer without checking it

D. A skipped lab

## Answer review

1. C. Apply what you learned without copying the guided solution.
2. D. Start with: Explain the challenge and make a short plan.
3. A. Step three is: Test the result and record evidence of your work.
4. B. The goal is: An independent demonstration with evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

## Mastery & safe-use plan

Ages 10-12

Digital safety: Use unique passphrases, recognize scams, protect privacy, behave respectfully, and pause before sharing.

AI literacy: Check AI claims with reliable sources, recognize synthetic content, protect private data, and disclose AI help.

Challenge: Solve a guided scenario without using real credentials or private information.

Portfolio: Finish an original game, website, safety plan, media story, or fact-check artifact.

Mastery check: Demonstrate the project, explain a decision, and correct one issue found during review.

## Project worksheet

My project: Build a coordinate-grid game plan

Who will use or review it? _____

My plan: _____

Checkpoint 1: A coordinate-grid game map with a tested path.

Checkpoint 2: Two correctly labeled health-bar percentages.

Checkpoint 3: A game-level pattern with a clear rule and prediction.

Checkpoint 4: A completed guided project with documented evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

Checkpoint 5: An independent demonstration with evidence: Coordinate level map, Scoring formula, Worked calculations, Balance-test explanation.

One thing I tested: _____

One thing I changed after testing: _____

What I learned: _____

Trusted adult or mentor feedback: _____

## Family review

Show your finished work to a trusted adult. Explain one thing you learned and one thing you would improve.

Beat IT Kids | For learning at home. Do not put real passwords or private details in practice projects.