Math Games for Young Coders

Ages 5-9 | Little Tech Explorers

Practice counting, shapes, and patterns through a coding-style treasure map.

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: Count the moves

LEARNING GOAL: Count the moves. Your finished work should demonstrate: A counted path to treasure.

EXPLAIN THE CONCEPT: Counting helps us tell a character how many spaces to move. Each space should be counted once. 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. Use the five-box path shown in the lesson. 2. Put a star in the last box. 3. Place a toy on the first box. 4. Count how many moves reach the star. Finished result: A counted path to treasure.

LOOK CLOSELY: Count each move from one square to the next. The starting square is where you begin, not a move you have already made. Move a toy slowly and say one number for each change of square.

FOLLOW AN EXAMPLE: Draw five squares in a row. Start in square one and make four right moves: land on squares two, three, four, and five. Four moves reach square five. Counting five moves would try to go beyond this map.

TRY AND EXPLAIN: Put a counter beside the route after each move, or ask an adult to count with you. Return to the same start and try two moves. Predict square three, then test. Explain the difference between a square number and the number of moves.

Understand with an example

The idea. Count one move for each step, rather than counting the starting space as a move. Touch, point to or mark each visited space so you can connect the instruction with the change in position. The route and the number of moves are related but different descriptions.

Get ready. Draw spaces 0 to 5 in a row. Put a paper character at 0 and prepare three

Right cards. No physical jumping is required.

Worked example 1

Follow the reasoning. Trace 0 -> 1 -> 2 -> 3. There are three moves and four visited positions including the start. Count the three arrows to check the move count instead of counting every numbered space touched.

Worked example 2: change one thing

Compare the result. Start at 1 and use the same three Right cards: 1 -> 2 -> 3 -> 4. The move count stays three while the ending number changes to four. Starting position matters.

Try one action at a time

1. Point to the start without counting a move.
2. Follow one Right card.
3. Mark each move with one tally.
4. Compare the three tallies with the ending space.

A mistake to notice

Pause and check. Ending on the number four does not always mean four moves were made.

Your own small challenge

Predict before trying. Start at 2 and move Right twice on the same row. Where do you end, and how many moves did you make?

Check your thinking

The character ends at 4 after two moves: 2 -> 3 -> 4. The starting space is not counted as a move.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

EXPLORE TOGETHER: Draw or point to the important parts of your work. Tell a trusted adult what happened first, next, and last.

SAFETY CHECK: Know what information stays private, stop and ask a trusted adult, and practice kind digital choices. 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 counted path to treasure.

Investigate with pictures and choices

A token moves right three times from space zero.
Where does it finish?
1. Space 3
2. Space 0
3. Space 6

Worked reasoning

Answer: Space 3. Count one move per space: 1, 2, 3. The starting space is zero moves.

Try a changed example

Use three physical counters and touch each exactly once.

Picture and meaning matches

Quantity: Shows how many
Shape: Has properties you can notice
Pattern: Repeats a chosen unit

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. Use the five-box path shown in the lesson.

2. Put a star in the last box.

3. Place a toy on the first box.

4. Count how many moves reach the star.

Finished result: A counted path to treasure.

Check your understanding

1. Which idea best describes Count the moves?

A. It has no purpose in this project.

B. Shapes have features such as sides and corners.

C. Counting helps us tell a character how many spaces to move.

D. A repeating pattern follows the same rule again and again.

2. What is the first step in this lab?

A. Count how many moves reach the star.

B. Put a star in the last box.

C. Place a toy on the first box.

D. Use the five-box path shown in the lesson.

3. What should you do after step two?

A. Place a toy on the first box.

B. Put a star in the last box.

C. Count how many moves reach the star.

D. Use the five-box path shown in the lesson.

4. Which result shows that your lab is finished?

A. A blank page with no work

B. A counted path to treasure.

C. A copied answer without checking it

D. A skipped lab

Answer review

1. C. Counting helps us tell a character how many spaces to move.

2. D. Start with: Use the five-box path shown in the lesson.

3. A. Step three is: Place a toy on the first box.

4. B. The goal is: A counted path to treasure.

Section 2: Shapes and position

LEARNING GOAL: Shapes and position. Your finished work should demonstrate: A shape map you can describe.

EXPLAIN THE CONCEPT: Shapes have features such as sides and corners. Position words such as above, below, left, and right help describe a map. 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. Use the circle, triangle, and square shown in the lesson. 2. Identify which shape is above the square in the provided visual. 3. Identify which shape is to the left of the square in the provided visual. 4. Explain the map using position words. Finished result: A shape map you can describe.

LOOK CLOSELY: Position words describe where something is compared with something else. Above and below need a reference object. A triangle has three sides; a rectangle has four right-angle corners. A square is a special rectangle with all sides equal.

FOLLOW AN EXAMPLE: Draw a square below a circle and a triangle to the circle's right. Ask a helper to find each shape using the description. Turning the paper may change which way the page faces, so agree which edge is the top before comparing answers.

TRY AND EXPLAIN: Choose an object as your reference and make two position statements. Check them by pointing. If you say the triangle is right, explain right of what. Clear reference words help another person rebuild your picture.

Understand with an example

The idea. A shape can keep its identity when it changes position or turns. Describe position using a clear reference: above the box, inside the box or to the right of the box. Pointing and placing a shape can demonstrate the relationship without requiring the learner to name every direction.

Get ready. Use one large drawn box, a triangle card and a circle card. Place the box in the same orientation for both attempts.

Worked example 1

Follow the reasoning. Place the triangle above the box and the circle inside it. Point to the box as the reference for both descriptions. The triangle has three sides wherever it is placed.

Worked example 2: change one thing

Compare the result. Rotate the triangle while leaving it above the box. It is still a triangle with three sides, and its position is still above the reference box. Turning the shape does not add a side.

Try one action at a time

1. Find the reference box.
2. Place the triangle above it.
3. Place the circle inside it.
4. Turn the triangle and check its sides again.

A mistake to notice

Pause and check. Do not confuse changing a shape's position or orientation with changing the kind of shape.

Your own small challenge

Predict before trying. Move the circle outside the box on its right side. Show which relationship changed.

Check your thinking

The circle is now to the right of and outside the box instead of inside. Its circular shape did not change.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

EXPLORE TOGETHER: Draw or point to the important parts of your work. Tell a trusted adult what happened first, next, and last.

SAFETY CHECK: Know what information stays private, stop and ask a trusted adult, and practice kind digital choices. 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 shape map you can describe.

Investigate with pictures and choices

A square is turned on one corner.

What stays the same?

1. It becomes a circle

2. It loses two sides

3. It still has four equal sides

Worked reasoning

Answer: It still has four equal sides. Turning a shape does not change its side lengths or number of sides.

Try a changed example

Turn a paper square and compare it with a nonsquare rectangle.

Picture and meaning matches

Quantity: Shows how many

Shape: Has properties you can notice

Pattern: Repeats a chosen unit

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. Use the circle, triangle, and square shown in the lesson.

2. Identify which shape is above the square in the provided visual.

3. Identify which shape is to the left of the square in the provided visual.

4. Explain the map using position words.

Finished result: A shape map you can describe.

Check your understanding

1. Which idea best describes Shapes and position?

A. It has no purpose in this project.

B. Counting helps us tell a character how many spaces to move.

C. Shapes have features such as sides and corners.

D. A repeating pattern follows the same rule again and again.

2. What is the first step in this lab?

A. Explain the map using position words.

B. Identify which shape is above the square in the provided visual.

C. Identify which shape is to the left of the square in the provided visual.

D. Use the circle, triangle, and square shown in the lesson.

3. What should you do after step two?

A. Identify which shape is to the left of the square in the provided visual.

B. Identify which shape is above the square in the provided visual.

C. Explain the map using position words.

D. Use the circle, triangle, and square shown in the lesson.

4. Which result shows that your lab is finished?

A. A blank page with no work

B. A shape map you can describe.

C. A copied answer without checking it

D. A skipped lab

Answer review

1. C. Shapes have features such as sides and corners.

2. D. Start with: Use the circle, triangle, and square shown in the lesson.

3. A. Step three is: Identify which shape is to the left of the square in the provided visual.

4. B. The goal is: A shape map you can describe.

Section 3: Pattern treasure map

LEARNING GOAL: Pattern treasure map. Your finished work should demonstrate: A number-and-shape treasure pattern.

EXPLAIN THE CONCEPT: A repeating pattern follows the same rule again and again. Recognizing the rule helps predict the next step. 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. Make a clap-tap-clap-tap pattern. 2. Replace clap with a star and tap with a circle. 3. Continue the picture pattern twice. 4. Put a treasure mark at the next predicted position. Finished result: A number-and-shape treasure pattern.

LOOK CLOSELY: A repeating rule helps predict what comes next.

Circle-square-circle-square repeats a two-shape unit. In a map, agree whether the shapes label places or tell you actions. A shape should not secretly change its job

during the game.

FOLLOW AN EXAMPLE: Draw six squares in a row. Put circle, square, circle, square, circle, square in them. Cover the fifth symbol. The repeating unit predicts circle. Put treasure beneath the sixth square; reaching it still needs five moves from square one.

TRY AND EXPLAIN: Ask an adult to change the fifth symbol to square in a practice copy. Find the mismatch and repair it. Explain the pattern rule separately from the movement count. A correct pattern does not automatically prove that the route has the right number of moves.

Understand with an example

The idea. A pattern rule helps predict the next symbol on a treasure route. Mark the repeating unit so another person can check your prediction. Using both shape and color makes the route easier to follow when colors are difficult to distinguish or unavailable.

Get ready. Lay a paper route of star, circle, star, circle, star with a blank sixth position. The stars and circles have distinct outlines.

Worked example 1

Follow the reasoning. Group star/circle as the repeating unit. Position six needs a circle to complete the third unit. Check positions one to six in three pairs before placing the pretend treasure.

Worked example 2: change one thing

Compare the result. Change the rule to star, circle, circle. For star/circle/circle/star/circle, the sixth shape is still circle, but the seventh is star. One matching prediction does not mean the two rules are the same.

Try one action at a time

1. Point to the repeating unit.
2. Group the existing route.
3. Predict and place the missing shape.
4. Extend one more position to check the rule.

A mistake to notice

Pause and check. Two different rules can give the same next symbol once. Check

another position before claiming the rules are identical.

Your own small challenge

Predict before trying. Continue square, triangle, square, triangle with two more shapes.

Check your thinking

Add square then triangle. The two-shape unit repeats in order; a drawing, selected cards or pointing can show the answer.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

EXPLORE TOGETHER: Draw or point to the important parts of your work. Tell a trusted adult what happened first, next, and last.

SAFETY CHECK: Know what information stays private, stop and ask a trusted adult, and practice kind digital choices. 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 number-and-shape treasure pattern.

Investigate with pictures and choices

A treasure map repeats two claps then one tap.

What is one repeating unit?

1. Only one clap
2. Clap, clap, tap
3. Clap, tap, tap

Worked reasoning

Answer: Clap, clap, tap. Name the entire repeated unit rather than one part of it.

Try a changed example

Make a silent version with three picture cards.

Picture and meaning matches

Quantity: Shows how many

Shape: Has properties you can notice

Pattern: Repeats a chosen unit

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. Make a clap-tap-clap-tap pattern.
2. Replace clap with a star and tap with a circle.
3. Continue the picture pattern twice.
4. Put a treasure mark at the next predicted position.

Finished result: A number-and-shape treasure pattern.

Check your understanding

1. Which idea best describes Pattern treasure map?

A. Counting helps us tell a character how many spaces to move.

B. A repeating pattern follows the same rule again and again.

C. Shapes have features such as sides and corners.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Replace clap with a star and tap with a circle.

B. Continue the picture pattern twice.

C. Make a clap-tap-clap-tap pattern.

D. Put a treasure mark at the next predicted position.

3. What should you do after step two?

A. Replace clap with a star and tap with a circle.

B. Put a treasure mark at the next predicted position.

C. Make a clap-tap-clap-tap pattern.

D. Continue the picture pattern twice.

4. Which result shows that your lab is finished?

A. A number-and-shape treasure pattern.

B. A copied answer without checking it

C. A skipped lab

D. A blank page with no work

Answer review

1. B. A repeating pattern follows the same rule again and again.
2. C. Start with: Make a clap-tap-clap-tap pattern.
3. D. Step three is: Continue the picture pattern twice.
4. A. The goal is: A number-and-shape treasure pattern.

Section 4: Guided Project & Worked Examples

COURSE INVESTIGATION: Count actions instead of squares

YOUR PRACTICE INPUT: A treasure marker starts on square 2 of a seven-square strip. Move right three times, then left once.

WHY IT WORKS: The route is 2 -> 3 -> 4 -> 5 -> 4. There are four moves; the finish is square 4.

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: Draw the strip, predict the finish, move one counter for each arrow, and compare the two starting positions.

COMPARE WITH THE EXPECTED RESULT: The learner distinguishes the starting square, number of moves, and ending square using a drawing or counters.

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: Treasure map, Pattern rule, Checked solution.

EXPLAIN THE CONCEPT: Review the course concepts through two applied examples. Count moves on a grid and compare two routes. Continue shape and number patterns using the rule. Guided project: Create a treasure map using coordinates-by-description,

shapes, counts, and repeating patterns. 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. Create a treasure map using coordinates-by-description, shapes, counts, and repeating patterns. 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: Treasure map, Pattern rule, Checked solution.

LOOK CLOSELY: Make a treasure route with six squares, a marked start, and a goal. Add an alternating circle-square pattern. Use a toy to test moves and paper shapes to test the repeating unit. Keep these two rules visible beside the map.

FOLLOW AN EXAMPLE: Start in square one. Make five right moves to square six. Name the visited squares after each move: two, three, four, five, six. Check the six symbols against circle-square repeated three times. Three pattern units and five moves are different counts.

TRY AND EXPLAIN: Ask a helper to cover one symbol and predict it. Then ask how many moves reach the goal. If an answer is wrong, show the matching rule and test again. Keep a drawing of the map as evidence, not just the final number.

Understand with an example

The idea. A number-and-shape map can combine counting, position and pattern prediction. State what each symbol means and keep the starting point clear. Check each part separately so a correct count does not hide an incorrect shape or location.

Get ready. Draw five spaces 0 to 4 in a row. Start at 0. Above the row show a route-key pattern star, circle, star, circle with a fifth shape missing.

Worked example 1

Follow the reasoning. Three Right cards take the character to space 3. The fifth pattern shape is star, since star/circle repeats. Place a pretend treasure star above space 3 and show the three moves plus the pattern reasoning.

Worked example 2: change one thing

Compare the result. Start at 1 with the same three Right cards. The character now ends at 4; the pattern's fifth shape stays star because its rule was not changed. Move the treasure marker to match the new route ending.

Try one action at a time

1. Mark the start and count the move cards.
2. Trace and tally the moves.
3. Complete the shape pattern separately.
4. Place the treasure using the route and shape results.

A mistake to notice

Pause and check. Changing the move count does not automatically change an unrelated pattern rule.

Your own small challenge

Predict before trying. Keep start 0 but use two Right cards. Where should the treasure go if the pattern rule is unchanged?

Check your thinking

Place the star treasure above space 2. The route ending changed to 2, while the fifth pattern shape remains star.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

EXPLORE TOGETHER: Draw or point to the important parts of your work. Tell a trusted adult what happened first, next, and last.

SAFETY CHECK: Know what information stays private, stop and ask a trusted adult, and practice kind digital choices. 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: Treasure map, Pattern rule, Checked solution.

Investigate with pictures and choices

You touched the same counting dot twice.

How can you keep one-to-one counting?

1. Mark it once and choose an untouched dot
2. Add two to the total
3. Start counting the labels instead

Worked reasoning

Answer: Mark it once and choose an untouched dot. Count each object once. A repeated touch does not create another object.

Try a changed example

Arrange five counters differently and compare the total.

Picture and meaning matches

Quantity: Shows how many

Shape: Has properties you can notice

Pattern: Repeats a chosen unit

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. Create a treasure map using coordinates-by-description, shapes, counts, and repeating patterns.
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: Treasure map,

Pattern rule, Checked solution.

Check your understanding

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

A. Counting helps us tell a character how many spaces to move.

B. Review the course concepts through two applied examples.

C. Shapes have features such as sides and corners.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Create a treasure map using coordinates-by-description, shapes, counts, and repeating patterns.

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. Create a treasure map using coordinates-by-description, shapes, counts, and repeating patterns.

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: Treasure map, Pattern rule, Checked solution.

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: Treasure map, Pattern rule, Checked solution.

Section 5: Independent Challenge & Mastery

INDEPENDENT TRANSFER CASE: Count actions instead of squares

KEEP THE ORIGINAL BASELINE: A treasure marker starts on square 2 of a seven-square strip. Move right three times, then left once.

CHANGE ONE CONDITION: Start on square 1 instead. The same moves now finish on square

3.

YOUR TASK: Draw the strip, predict the finish, move one counter for each arrow, and compare the two starting positions.

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 learner distinguishes the starting square, number of moves, and ending square using a drawing or counters.

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: Treasure map, Pattern rule, Checked solution.

EXPLAIN THE CONCEPT: Apply what you learned without copying the guided solution. Independent challenge: Design a new path whose answer can be checked two different ways. Safety and responsibility: Use pretend names/numbers in activities rather than personal identifiers. 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. Design a new path whose answer can be checked two different ways. 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: Treasure map, Pattern rule, Checked solution.

LOOK CLOSELY: Build a new treasure map with a different length or a different repeating unit. Tell your helper the start, what counts as a move, and which pattern to follow. A short accurate map is better than a long confusing one.

FOLLOW AN EXAMPLE: For a four-square route, start at the first square and use three

right moves to the last. Try triangle-circle-triangle-circle as the labels. Explain the next symbol would be triangle if the row continued, but that imaginary symbol is outside the drawn route.

TRY AND EXPLAIN: Show one movement test and one pattern prediction. Explain an error you corrected, such as counting the start as a move. Use pointing, counters, drawings, or speech; an adult can write down your explanation without doing the thinking for you.

Understand with an example

The idea. An independent map gives the learner a chance to combine ideas and explain two checks. Keep the numbers small enough for a visible trace. Let the learner select the start and pattern, while a helper records or moves pieces according to those choices.

Get ready. Offer a six-space row 0 to 5 and large star/circle or square/triangle cards. The learner can choose a start and a short route that stays on the row.

Worked example 1

Follow the reasoning. Choose start 1, two Right cards and the pattern square/triangle/square/triangle. The route ends at 3, and the next pattern shape is square. Both answers can be checked with marks and grouped cards.

Worked example 2: change one thing

Compare the result. Change only the pattern to circle/star/circle/star. The route still ends at 3, but the next shape becomes circle. Separating the checks shows which result belongs to which rule.

Try one action at a time

1. Choose a start and valid move cards.
2. Make a repeating shape route key.
3. Predict the ending and the next shape.
4. Show two checks and explain one change.

A mistake to notice

Pause and check. Do not treat copying the example numbers as the only way to show understanding.

Your own small challenge

Predict before trying. Make your own map, then change only the starting space. Which parts need to be checked again?

Check your thinking

Recheck every route position and the ending. An unchanged separate shape pattern keeps its rule. If the new route would leave the row, revise it openly rather than wrapping without a rule.

Show what you know. Point, draw, demonstrate, type, speak or use your usual communication tool. A trusted adult can help without choosing your answer.

EXPLORE TOGETHER: Draw or point to the important parts of your work. Tell a trusted adult what happened first, next, and last.

SAFETY CHECK: Know what information stays private, stop and ask a trusted adult, and practice kind digital choices. 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: Treasure map, Pattern rule, Checked solution.

Investigate with pictures and choices

All four counters move into a new arrangement.

How many are there now?

1. Six because the row is longer
2. Zero because they moved
3. Four

Worked reasoning

Answer: Four. Rearranging the same set without adding or removing objects preserves its quantity.

Try a changed example

Remove one counter and explain why the total changes this time.

Picture and meaning matches

Quantity: Shows how many

Shape: Has properties you can notice

Pattern: Repeats a chosen unit

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. Design a new path whose answer can be checked two different ways.
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: Treasure map, Pattern rule, Checked solution.

Check your understanding

1. Which idea best describes Independent Challenge & Mastery?

A. It has no purpose in this project.

B. Counting helps us tell a character how many spaces to move.

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

D. Shapes have features such as sides and corners.

2. What is the first step in this lab?

A. Review the safety scenario and describe one improvement.

B. Design a new path whose answer can be checked two different ways.

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. Design a new path whose answer can be checked two different ways.

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: Treasure map, Pattern rule, Checked solution.

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: Treasure map, Pattern rule, Checked solution.

Mastery & safe-use plan

Ages 5-9 with a trusted adult nearby

Digital safety: Know what information stays private, stop and ask a trusted adult, and practice kind digital choices.

AI literacy: AI is a computer tool, can make mistakes, and should never replace a trusted adult.

Challenge: Complete a short picture, sorting, pattern, or safety-choice mission.

Portfolio: Save one drawing, map, story, or coding plan and explain it to a trusted adult.

Mastery check: Show the skill, explain one safe choice, and identify who to ask for help.

Project worksheet

My project: Build a number-and-shape treasure map

Who will use or review it? _____

My plan: _____

Checkpoint 1: A counted path to treasure.

Checkpoint 2: A shape map you can describe.

Checkpoint 3: A number-and-shape treasure pattern.

Checkpoint 4: A completed guided project with documented evidence: Treasure map, Pattern rule, Checked solution.

Checkpoint 5: An independent demonstration with evidence: Treasure map, Pattern rule, Checked solution.

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.