Math for Apps & Data

Ages 13-15 | Tech Builders

Use equations, chance, and data to make a small app dashboard.

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: Functions

LEARNING GOAL: Functions. Your finished work should demonstrate: A labeled graph of a score function.

EXPLAIN THE CONCEPT: A function maps an input to an output using a rule. For example, y = 2x + 1 turns x = 3 into y = 7. Apps use rules to update scores, totals, and graphs. 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 a score rule y = 2x + 1. 2. Calculate outputs for x = 0, 1, 2, and 3. 3. Plot the input-output pairs on a graph. 4. Change the rule and describe how the graph changes. Finished result: A labeled graph of a score function.

EXPLAIN THE MECHANISM: A function maps an allowed input to one output under a rule. Tables, formulas, and graphs can represent the same relationship. Define the input domain and units before interpreting outputs; a formula alone does not explain what the numbers mean.

WORKED CASE: For y = 2x + 1, inputs 0, 1, 2, and 3 give outputs 1, 3, 5, and 7. Compare y = x + 4: both give 7 at x = 3, but at x = 0 the outputs are 1 and 4. Matching once does not make the rules identical.

TEST AND JUSTIFY: Build both tables and plot their points on clearly labeled axes. Substitute one input to verify a plotted point. State whether intermediate inputs make sense for your scenario, such as a score based on a whole number of collected tokens.

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: Recognize phishing and social engineering, secure accounts, understand

privacy settings, and perform cyber labs only with authorization. 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 labeled graph of a score function.

Investigate with pictures and choices

A function is f(x) = 2x + 1.

What is f(3)?

1. 6
2. 7
3. 9

Worked reasoning

Answer: 7. Substitute three: 2 times 3 plus 1 equals seven.

Try a changed example

Find the output for zero and explain the change.

Picture and meaning matches

Function rule: Maps input to output

Probability: Describes uncertainty

Statistics: Summarizes observations

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 a score rule y = 2x + 1.
2. Calculate outputs for x = 0, 1, 2, and 3.
3. Plot the input-output pairs on a graph.
4. Change the rule and describe how the graph changes.

Finished result: A labeled graph of a score function.

Check your understanding

1. Which idea best describes Functions?

A. A function maps an input to an output using a rule.

B. The mean is a total divided by the number of values.

C. It has no purpose in this project.

D. Probability is the likelihood of an event.

2. What is the first step in this lab?

A. Plot the input-output pairs on a graph.

B. Write a score rule y = 2x + 1.

C. Change the rule and describe how the graph changes.

D. Calculate outputs for x = 0, 1, 2, and 3.

3. What should you do after step two?

A. Change the rule and describe how the graph changes.

B. Write a score rule y = 2x + 1.

C. Plot the input-output pairs on a graph.

D. Calculate outputs for x = 0, 1, 2, and 3.

4. Which result shows that your lab is finished?

A. A copied answer without checking it

B. A skipped lab

C. A blank page with no work

D. A labeled graph of a score function.

Answer review

1. A. A function maps an input to an output using a rule.
2. B. Start with: Write a score rule y = 2x + 1.
3. C. Step three is: Plot the input-output pairs on a graph.
4. D. The goal is: A labeled graph of a score function.

Section 2: Probability

LEARNING GOAL: Probability. Your finished work should demonstrate: A table comparing theoretical and experimental probability.

EXPLAIN THE CONCEPT: Probability is the likelihood of an event. A fair six-sided die has six equally likely outcomes, so the chance of one chosen number is 1/6. Real tests may vary from the predicted fraction. 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. Predict the probability of rolling an even number on a fair die. 2. Roll a die or use a safe simulator 20 times. 3. Count the even results and calculate the experimental fraction. 4. Compare the result with the predicted probability of 3/6. Finished result: A table comparing theoretical and experimental probability.

EXPLAIN THE MECHANISM: Probability describes uncertainty under stated assumptions. For a fair six-sided die, each face has probability 1/6 and an even result has probability 3/6 = 1/2. A theoretical probability is not a promise that a short experiment produces exactly that fraction.

WORKED CASE: In twenty fictional rolls, twelve even outcomes give an observed frequency of 12/20 = 60%. That differs from the theoretical 50%. The difference alone does not prove the die is unfair; small samples vary. Clearly label invented results rather than reporting them as a real experiment.

TEST AND JUSTIFY: List the possible outcomes and favorable outcomes before calculating. Compare a prediction with an actual safe classroom tally if you run one. Record the sample size and avoid claiming that the next roll must compensate for an earlier sequence.

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: Recognize phishing and social engineering, secure accounts, understand privacy settings, and perform cyber labs only with authorization. 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

table comparing theoretical and experimental probability.

Investigate with pictures and choices

A fair six-sided die has three even faces.

What is the chance of an even result?

1. 3/6 = 1/2
2. 1/6
3. 3/3

Worked reasoning

Answer: 3/6 = 1/2. The favorable outcomes are 2, 4 and 6 out of six equally likely faces.

Try a changed example

Compare the theoretical probability with a small tally of simulated rolls.

Picture and meaning matches

Function rule: Maps input to output

Probability: Describes uncertainty

Statistics: Summarizes observations

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. Predict the probability of rolling an even number on a fair die.
2. Roll a die or use a safe simulator 20 times.
3. Count the even results and calculate the experimental fraction.
4. Compare the result with the predicted probability of 3/6.

Finished result: A table comparing theoretical and experimental probability.

Check your understanding

1. Which idea best describes Probability?

A. It has no purpose in this project.

B. A function maps an input to an output using a rule.

C. Probability is the likelihood of an event.

D. The mean is a total divided by the number of values.

2. What is the first step in this lab?

A. Compare the result with the predicted probability of 3/6.

B. Roll a die or use a safe simulator 20 times.

C. Count the even results and calculate the experimental fraction.

D. Predict the probability of rolling an even number on a fair die.

3. What should you do after step two?

A. Count the even results and calculate the experimental fraction.

B. Roll a die or use a safe simulator 20 times.

C. Compare the result with the predicted probability of 3/6.

D. Predict the probability of rolling an even number on a fair die.

4. Which result shows that your lab is finished?

A. A blank page with no work

B. A table comparing theoretical and experimental probability.

C. A copied answer without checking it

D. A skipped lab

Answer review

1. C. Probability is the likelihood of an event.

2. D. Start with: Predict the probability of rolling an even number on a fair die.

3. A. Step three is: Count the even results and calculate the experimental fraction.

4. B. The goal is: A table comparing theoretical and experimental probability.

Section 3: Statistics

LEARNING GOAL: Statistics. Your finished work should demonstrate: A small dashboard with a mean, median, and explanation.

EXPLAIN THE CONCEPT: The mean is a total divided by the number of values. The median is the middle value after sorting. Both can summarize data, but an unusual value may pull the mean away. 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. Record five sample app usage times: 10, 12, 12, 14, 32

minutes. 2. Sort the values and find the median. 3. Add them and divide by five to find the mean. 4. Explain which summary best describes a typical day and why.
Finished result: A small dashboard with a mean, median, and explanation.
EXPLAIN THE MECHANISM: The mean adds the values and divides by their count. The median uses the middle of sorted values. Each summarizes a different aspect. Always state the units, number of observations, and any missing-value decisions.
WORKED CASE: For 2, 3, 3, 4, 18, the sum is 30 and the mean is 6. The sorted middle value is 3, so the median is 3. The large 18 pulls the mean upward. Do not remove it just because it is inconvenient; first ask whether it is a valid observation or a recorded error.
TEST AND JUSTIFY: Replace 18 with 8 in a clearly labeled comparison set. The new sum is 20, mean 4, and median still 3. Explain which summary changed and why. A summary number does not replace the original data or describe every observation.
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: Recognize phishing and social engineering, secure accounts, understand privacy settings, and perform cyber labs only with authorization. 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 small dashboard with a mean, median, and explanation.

Investigate with pictures and choices

The sorted values are 2, 3, 3, 4, 18.

What is the median?

1. 6
2. 18
3. 3

Worked reasoning

Answer: 3. The median is the middle value in the ordered list.

Try a changed example

Add another value and explain how an even-length median is found.

Picture and meaning matches

Function rule: Maps input to output

Probability: Describes uncertainty

Statistics: Summarizes observations

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. Record five sample app usage times: 10, 12, 12, 14, 32 minutes.
2. Sort the values and find the median.
3. Add them and divide by five to find the mean.
4. Explain which summary best describes a typical day and why.

Finished result: A small dashboard with a mean, median, and explanation.

Check your understanding

1. Which idea best describes Statistics?

A. Probability is the likelihood of an event.

B. It has no purpose in this project.

C. A function maps an input to an output using a rule.

D. The mean is a total divided by the number of values.

2. What is the first step in this lab?

A. Record five sample app usage times: 10, 12, 12, 14, 32 minutes.

B. Explain which summary best describes a typical day and why.

C. Sort the values and find the median.

D. Add them and divide by five to find the mean.

3. What should you do after step two?

A. Record five sample app usage times: 10, 12, 12, 14, 32 minutes.

B. Add them and divide by five to find the mean.

C. Sort the values and find the median.

D. Explain which summary best describes a typical day and why.

4. Which result shows that your lab is finished?

A. A skipped lab

B. A blank page with no work

C. A small dashboard with a mean, median, and explanation.

D. A copied answer without checking it

Answer review

1. D. The mean is a total divided by the number of values.

2. A. Start with: Record five sample app usage times: 10, 12, 12, 14, 32 minutes.

3. B. Step three is: Add them and divide by five to find the mean.

4. C. The goal is: A small dashboard with a mean, median, and explanation.

Section 4: Guided Project & Worked Examples

COURSE INVESTIGATION: A percentage needs its denominator

YOUR PRACTICE INPUT: An app gets 20 sign-ups from 100 visits on Monday and 30 from 200 visits on Tuesday.

WHY IT WORKS: Monday converts 20%; Tuesday converts 15%. Tuesday has more sign-ups but a lower conversion rate.

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 daily and combined rates, choose a consistent precision, and write a caption explaining the denominator.

COMPARE WITH THE EXPECTED RESULT: The combined rate uses total sign-ups and visits, and the caption distinguishes rate from count.

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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.
EXPLAIN THE CONCEPT: Review the course concepts through two applied examples. Represent an app's input/output relationship with a table and simple function. Calculate mean, median, range, and percentage change from a small synthetic dataset.
Guided project: Build a small dashboard plan using functions, percentages, descriptive statistics, and an appropriate chart. 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. Build a small dashboard plan using functions, percentages, descriptive statistics, and an appropriate chart. 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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.
EXPLAIN THE MECHANISM: Create a fictional app report combining an input-output rule, a chance calculation, and a small data summary. Keep the three questions separate so a result from one is not accidentally used as evidence for another. Label all invented observations.
WORKED CASE: Use $y = 2x + 1$ for token scores; compute 3/6 for even die outcomes; summarize 2, 3, 3, 4, 18 with mean 6 and median 3. These describe a rule, an assumed chance, and a dataset respectively.
TEST AND JUSTIFY: Present a table and a short explanation for each calculation. Verify the score at $x = 3$, count the favorable die faces, and sort before finding the median. Ask a helper to identify the assumptions and units without your prompting.
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: Recognize phishing and social engineering, secure accounts, understand privacy settings, and perform cyber labs only with authorization. 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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

Investigate with pictures and choices

A chart shows test scores but no units or sample count.
What should the presentation add?
1. A claim about all students
2. Labels, units and the number of observations
3. More decoration only

Worked reasoning

Answer: Labels, units and the number of observations. A chart needs context for its numbers and the population observed.

Try a changed example

Describe a conclusion the small sample cannot establish.

Picture and meaning matches

Function rule: Maps input to output
Probability: Describes uncertainty
Statistics: Summarizes observations

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. Build a small dashboard plan using functions, percentages, descriptive statistics, and an appropriate chart.
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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

Check your understanding

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

A. A function maps an input to an output using a rule.

B. Review the course concepts through two applied examples.

C. Probability is the likelihood of an event.

D. It has no purpose in this project.

2. What is the first step in this lab?

A. Build a small dashboard plan using functions, percentages, descriptive statistics, and an appropriate chart.

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. Build a small dashboard plan using functions, percentages, descriptive statistics, and an appropriate chart.

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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

Section 5: Independent Challenge & Mastery

INDEPENDENT TRANSFER CASE: A percentage needs its denominator

KEEP THE ORIGINAL BASELINE: An app gets 20 sign-ups from 100 visits on Monday and 30 from 200 visits on Tuesday.

CHANGE ONE CONDITION: Combine both days: 50 sign-ups / 300 visits = 16.67% approximately. Averaging 20% and 15% without weights gives a different answer.

YOUR TASK: Calculate daily and combined rates, choose a consistent precision, and write a caption explaining the denominator.

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 combined rate uses total sign-ups and visits, and the caption distinguishes rate from count.

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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

EXPLAIN THE CONCEPT: Apply what you learned without copying the guided solution. Independent challenge: Given two charts of the same data, identify how scale or chart choice can mislead and redesign the weaker one. Safety and responsibility: Use synthetic/non-identifying data and explain why a technically correct statistic can still be misleading. 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. Given two

charts of the same data, identify how scale or chart choice can mislead and redesign the weaker one. 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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

EXPLAIN THE MECHANISM: Design a new fictional app question and choose a suitable mathematical model. State what each variable measures and where the model applies. Avoid calling an invented dataset measured evidence.

WORKED CASE: An app reports only the average of a small dataset. Add the median, sample size, and raw values so a reader can see whether one unusual value influences the result. Explain why two datasets can share a mean but have different patterns.

TEST AND JUSTIFY: Submit the rule, worked calculations, a graph or table, and one changed-condition test. Identify a limit, such as a small sample or an assumed fair die. A correct calculation and an appropriate interpretation are both required.

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: Recognize phishing and social engineering, secure accounts, understand privacy settings, and perform cyber labs only with authorization. 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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

Investigate with pictures and choices

One value is missing from a data table.

What is a defensible next step?

1. State a missing-data policy before calculating
2. Always replace it with zero
3. Hide the missing row silently

Worked reasoning

Answer: State a missing-data policy before calculating. A measured zero and missing observation are not interchangeable.

Try a changed example

Calculate both an explicitly excluded-missing mean and a zero-included mean.

Picture and meaning matches

Function rule: Maps input to output

Probability: Describes uncertainty

Statistics: Summarizes observations

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. Given two charts of the same data, identify how scale or chart choice can mislead and redesign the weaker one.
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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

Check your understanding

1. Which idea best describes Independent Challenge & Mastery?

A. It has no purpose in this project.

B. A function maps an input to an output using a rule.

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

D. Probability is the likelihood of an event.

2. What is the first step in this lab?

A. Review the safety scenario and describe one improvement.

B. Given two charts of the same data, identify how scale or chart choice can mislead and redesign the weaker one.

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. Given two charts of the same data, identify how scale or chart choice can mislead and redesign the weaker one.

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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

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: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

Mastery & safe-use plan

Ages 13-15

Digital safety: Recognize phishing and social engineering, secure accounts, understand privacy settings, and perform cyber labs only with authorization.

AI literacy: Evaluate bias, hallucinations, deepfakes, privacy risks, attribution, and responsible model use.

Challenge: Complete an independent debugging, defense, data, or design scenario with documented reasoning.

Portfolio: Publish a sanitized project artifact with README-style purpose, steps, screenshots or evidence, and lessons learned.

Mastery check: Explain the design, demonstrate testing, identify a security or ethics risk, and defend one improvement.

Project worksheet

My project: Create a data-powered app dashboard

Who will use or review it? _____

My plan: _____

Checkpoint 1: A labeled graph of a score function.

Checkpoint 2: A table comparing theoretical and experimental probability.

Checkpoint 3: A small dashboard with a mean, median, and explanation.

Checkpoint 4: A completed guided project with documented evidence: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

Checkpoint 5: An independent demonstration with evidence: Calculation sheet, Dashboard/chart, Function explanation, Data-ethics reflection.

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.