

THE INVESTIGATORS **FORMATIVE ASSESSMENTS**

The Investigators: Formative Assessments

Pre-Game Assessments

Pre-Game Task #1

You come across a social media post claiming that your school cafeteria cooks with rotten food. It includes a picture of a moldy tomato. How should you evaluate the post to check its accuracy?

- A. Carefully examine the picture of the tomato.
- B. Check how many times the post has been liked.
- C. Consider who created the post.
- D. Read people's comments in response to the post.

Answers

- A. Incorrect: It is often impossible to determine whether a photograph has been manipulated just by looking at it.
- B. Incorrect: The number of times a post has been liked is not an indicator of its accuracy.
- C. Correct: It is crucial to consider who created a post and whether they are a trustworthy source of information about this topic.
- D. Incorrect: Reading comments on a social media post is not an effective strategy for determining its accuracy.

Pre-Game Task #2

One of your friends sends you a link to an online video that claims that people eating more ice cream leads to an increase in shark attacks. The video includes a graph that shows shark attacks go up when more ice cream is sold. What's wrong with this claim?

- A. There's no way to know how much ice cream is sold.
- B. There's no evidence that ice cream sales cause shark attacks.
- C. There's no way to track shark attacks.
- D. There's no way to evaluate claims in online videos.

Answers

- A. Incorrect: Data about ice cream sales is available.
- B. Correct: There is no evidence that ice cream sales cause shark attacks. Both ice cream sales and shark attacks increase in the summer when the weather is warmer, but that doesn't mean that one causes the other.
- C. Incorrect: Data about shark attacks is available.
- D. Incorrect: There are many effective strategies for evaluating claims in online videos.

Pre-Game Task #3

An infographic pops up in your social media feed showing various reasons why school uniforms help students learn more effectively. The infographic is marked “Sponsored Content.” Which of the following facts would help you decide if it is a trustworthy source?

- A. Anybody can post information to social media.
- B. This is an advertisement and the company that paid for it may benefit financially.
- C. The infographic is clear and well designed, which makes it easy to understand the information that it presents.
- D. The infographic includes data and statistics about school uniforms, which gives it more authority about the benefits of uniforms.

Answers

- A. Incorrect: Anybody can post information to social media, but that doesn’t mean that all online information is untrustworthy. You just need to evaluate it carefully.
- B. Correct: “Sponsored content” is a term for an advertisement that looks like a news story. The company that paid for the infographic can present information that benefits them regardless of whether it is fully accurate.
- C. Incorrect: The design of an infographic is not an indication of its trustworthiness.
- D. Incorrect: Including more data and statistics does not make something more trustworthy. In fact, individuals or groups often include more information to create the appearance of credibility.

Pre-Game Task #4

Your friend texts you a link to a news story with the headline, “Birds in Australia are intentionally setting fires!” How could you determine if this is true?

- A. Text your friend and ask if it is real.
- B. Do nothing. The claim is absurd. Birds can’t set fires.
- C. Look at your social media feed to see if anyone else has shared the same story.
- D. Search online to see if you can find information about birds setting fires.

Answers

- A. Incorrect: Your friend is probably not an expert on birds in Australia. It would be better to seek out a more authoritative source of information.
- B. Incorrect: We can’t judge a claim just based on our own beliefs. Instead, we should use the power of the internet to find better information.
- C. Incorrect: We shouldn’t make decisions about what to believe online based on whether other people are sharing the same story.
- D. Correct: The best way to verify a claim online is to search for information about it from trusted sources. In fact, if you search online, you’ll find articles about birds in Australia intentionally setting fires to flush out prey from sources like [National Geographic](#), [The New York Times](#), [The National Post](#), and other respected outlets.

Pre-Game Task #5

Your school is holding elections for class president. On social media, a 5-second video clip appears showing one of the candidates for class president saying, “I hate our school” during a recent debate for candidates. How could you determine whether to trust the video?

- A. Watch it carefully to see if it has been doctored.
- B. See how many times it has been viewed.
- C. Watch the original video, not just a clip.
- D. Ask your friends if they think it is real.

Answers

- A. Incorrect: It is often impossible to determine whether a video has been manipulated just by watching it.
- B. Incorrect: The number of times a video has been viewed is not a reflection of its trustworthiness.
- C. Correct: It is very easy to edit a video in a way that distorts its meaning. To truly understand a short clip, it is important to see what was said before and after.
- D. Incorrect: Your friends could be misled by a deceptively edited video, too.

Pre-Game Task #6

Your friend sends you a social media video of a person talking about why starting school later in the day helps students learn more. How could you evaluate the trustworthiness of the video?

- A. Watch the video to see if it seems like it was made by professionals.
- B. Check whether the person in the video is an expert on the topic.
- C. Look to see how many times the video has been viewed.
- D. Examine it carefully to see if it is a deepfake.

Answers

- A. Incorrect: Professional editing of a video is not an indication of trustworthiness.
- B. Correct: It is critically important to consider the background of the person speaking and whether they are an expert on the given topic or in a position to be an objective source.
- C. Incorrect: The number of times a video has been viewed is not a reflection of its trustworthiness.
- D. Incorrect: It is often incredibly difficult to determine whether a video is a deepfake just by looking at it.

Pre-Game Task #7

After a terrible hurricane, everybody is sharing on social media a picture of a shark swimming down a flooded street. How could you check the accuracy of the picture?

- A. Do a reverse image search to investigate where the picture originally came from.
- B. Check Wikipedia to see if sharks can swim in shallow water.
- C. See how many times the picture has been shared on social media.
- D. Look at the picture closely to see if you can detect signs that it has been manipulated.

Answers

- A. Correct: A reverse image search is an effective strategy for evaluating images online. Such a search would reveal that a manipulated image of a shark swimming down a flooded street has often been shared after other large storms, too.
- B. Incorrect: Although Wikipedia can be a good source of information, looking for information about whether sharks can swim in shallow water does not help us evaluate the accuracy of this picture.
- C. Incorrect: Just because something has been shared a lot does not mean it is accurate.
- D. Incorrect: Our eyes can deceive us. It is often impossible to determine whether a picture has been manipulated just by looking at it.

Pre-Game Task #8

Your school is considering holding classes on Saturdays. At a school board meeting, a parent who supports the proposal said, “A recent study shows that holding school on Saturdays leads students to learn 25% more.” What question(s) might you ask to determine if this information is trustworthy?

- A. Who conducted the study?
- B. What do other studies say?
- C. What did the rest of the study say?
- D. All of the above.

Answers

- A. Correct: It is important to consider whether the authors of a study are experts on the topic.
- B. Correct: It is important to consider whether other studies have reached similar conclusions. It is easy to cherry-pick a single study that is not representative.
- C. Correct: It is important to see whether there were other relevant findings in the study besides the fact cited in the meeting. It is easy to cherry-pick a single statistic that is not representative of the broader study.
- D. Correct: See above.

Story 1: Sustainability

Sustainability Task #1

Explain to students: *In the sustainability story in The Investigators, the lunch lady claims that the waste management company won't recycle dirty containers. What might you do to check if she is right?*

Display PowerPoint and ask students to select an answer:

- A. Search for the hashtag #recyclingdirtycontainers on social media and read through the posts.
- B. Accept what the lunch lady says because she has the most experience in the school with recycling.
- C. Go to the website of the Environmental Protection Agency (epa.gov) and search for information about recycling.
- D. Enter the keywords "is the lunch lady right about dirty plastic containers" into a search engine and read the results to get an unbiased view.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Incorrect: A hashtag search isn't a reliable way to turn up good information online.
- B. Incorrect: Sure, the lunch lady knows a lot about recycling, but she is still only one person, and her opinions need to be verified.
- C. Correct: The Environmental Protection Agency oversees and sets recycling recommendations for the U.S. It is also a .gov site, which indicates it is from a government source, which often provides authoritative information.
- D. Incorrect: The search is too specific. It will yield many irrelevant results.

Sustainability Task #2

Explain to students: *In the sustainability story in The Investigators, you're told that the school's high energy consumption might be due to old light bulbs. Say you wanted to investigate this question and went online to look for information.*

Display PowerPoint and ask students to select an answer:

You want to find out if incandescent bulbs consume more energy than LED bulbs. You land on two different sites, **realtruthaboutbulbs.org** and **verifiedenergyfacts.com**. The two sites offer conflicting information about light bulbs. To evaluate which of these two sites is a better source of information, you would:

- A. Look at the URL for **realtruthaboutbulbs.org** and notice that it is a .org, which tells you that it is a nonprofit organization.
- B. Look at the URL for **verifiedenergyfacts.com** and notice that it is a .com, which tells you that the organization is just out to make money.
- C. Reject both sites because their names are strange.
- D. Go to Wikipedia to see if there's anything written about either of the organizations behind these sites.

Ask students to share which option they chose and to share their reasoning. If they are like the thousands of students who have completed similar tasks in the last few years, they are likely to put their faith in a .org much more than a .com.

Go through the possible answers as a class:

- A. Incorrect: Despite what you may have been taught, anyone can obtain a .org site. You can't assume just by the letters .org that a site is legitimate. The .org designation was one of the original domains created by the US government when they set up the domain system in the 1990s. From its inception, .org has been an "open" domain, just like .com (and unlike .gov or .mil). Even though many legitimate nonprofit organizations use the .org designation, so do many lobbyists and scammers. To learn more about the dangers of assuming .org is trustworthy, see [this](#) short article.
- B. Incorrect: While .com stands for "commerce," many .com sites offer legitimate information (practically all major news sources are .com sites). You cannot assume that a site is untrustworthy just because it ends in .com.
- C. Incorrect: Don't judge a site by its name. Sometimes sites will pick unusual names because a more common name has already been taken.
- D. Correct: Wikipedia is often a good stop when learning about an organization, particularly organizations that are known to be scams. Always check the footnotes of a Wikipedia entry and click on the source of information, just to make sure it's credible.

Sustainability Task #3

Explain to students: *In the sustainability story in The Investigators, Drew said that he didn't know that there were recycling bins. Imagine that afterwards Drew surveys the students in his first period precalculus class, which is one of twelve different math classes in the school. He finds out that he's the only one who doesn't recycle. All of the other students know where the recycling bins are located and claim that they "always" or "almost always" recycle their trash. Drew admits, "I was wrong. I learned that most of the kids in the school recycle." What's the problem with Drew's statement?*

Display PowerPoint and ask students to select an answer:

- A. Precalculus students may be more likely to recycle than the average student at the school.
- B. Students may claim that they "always" or "almost always" recycle, but that's just what they say. No one has actually observed them.
- C. He only surveyed one class period. Other class periods might say something different.
- D. All of the above.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Correct: There are 12 different math classes in the school and precalculus is only one of them. The students in precalculus may not reflect all students in the school. In fact, all three answers are correct. See also the answers for B and C.
- B. Correct: Self-report answers on a survey should always be viewed cautiously. People often don't do what they claim on a survey. In fact, all three answers are correct. See also the answers for A and C.
- C. Correct: This particular class may be different than other classes in the school. In fact, all three answers are correct. See also the answers for A and B.
- D. Correct: See the answers for A, B, and C.

Sustainability Task #4

Explain to students: *In the sustainability story in The Investigators, the school's water usage is very high. Imagine that the school received an analysis by a company that sells toilets called ToiletsRus.com. This company provided the school with a report that says installing low-flow toilets in the school's bathrooms would raise the sustainability score by 50%. Why might you question the accuracy of this report?*

Display PowerPoint and ask students to select an answer:

- A. ToiletsRus.com sounds like a fake website.
- B. There's no way you should trust a .com site because .com stands for "commercial," which means that the goal is to make a profit.
- C. The company ToiletsRus.com has an incentive to sell new toilets, so they may exaggerate the benefits of low-flush toilets.
- D. Compared to fixing a leak, there's absolutely no way that installing low-flow toilets would result in greater water savings.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Incorrect: You shouldn't judge a website by its name.
- E. Incorrect: You can't judge a site by its .com or .org ending. It's a myth that .com or .org tell you something conclusive about the nature of the site. The .org designation was one of the original domains created by the US government when they set up the domain system in the 1990s. From its inception, .org has been an "open" domain, just like .com (and unlike .gov or .mil). Even though many legitimate nonprofit organizations use the .org designation, so do many lobbyists and scammers. To learn more about the dangers of assuming .org is trustworthy, see [this](#) short article.
- B. Correct: The company stands to gain if you buy their product, so they may have exaggerated the benefits of low-flow toilets. However, you can't automatically reject the information they provide. You should check this information against an authoritative, independent source.
- C. Incorrect: It is impossible to make this conclusion without knowing exactly how much water is being wasted from the leak and how much water savings would be realized by installing low-flow toilets.

Story 2: New School Sport

New School Sport Task #1

Explain to students: *In the sports story in The Investigators, Coach Smith says that he was such a superb soccer player that he "almost went professional." What would be the best way to check his claim?*

Display PowerPoint and ask students to select an answer:

- A. Search for Coach Smith's name (including his first and middle name) AND "soccer" AND "professional tryouts" and read through the first two pages of results.
- B. Ask Vice Principal Johnson, who tells you, "I have known Smith for 15 years, and during this time he has never once lied. If he says he almost went professional, believe him!"
- C. Search online and find a digitized copy of Coach Smith's college yearbook, where you locate multiple photos of him on the college soccer team.
- D. Search for and watch a video of Coach Smith that he posted last week, where his skills on the soccer field seem professional.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Correct. By entering these keywords into your browser (especially Coach Smith's full name, "Gaylord Clifton Smith") and using AND to tie them together, you increase the chances that you will turn up something that addresses Coach Smith's claim. After going through two pages of results, you should gain a better sense of whether his claim is true or not.
- B. Incorrect. Vice Principal Johnson is offering his personal opinion about Coach Smith's honesty. Vice Principal Johnson may be correct, but it is still just the opinion of one person.
- C. Incorrect. Coach Smith might have been a star soccer player in college but that doesn't mean he "almost went professional." Many people play college soccer but never come close to making it to the pros.
- D. Incorrect. There are many people with excellent soccer skills, but that doesn't mean he almost played professionally. Also, how does a video posted last week provide evidence of what happened in the past?

New School Sport Task #2

Explain to students: *In the sports story in The Investigators, Mr. Kirkland believes that archery will "encourage students to learn about history." Which of the following sources provides strong evidence to support Mr. Kirkland's claim?*

Display PowerPoint and ask students to select an answer:

- A. An infographic from the International Association of Archery, which says that students who are required to take archery are 50% more passionate about studying history.
- B. A story from *The Wall Street Journal* about a famous historian who pursued archery in middle school. The article quotes the historian saying, "Archery is responsible for my deciding to choose history as a career."
- C. An article on Harvard University's website that says that among Harvard students who choose archery as their physical education elective, almost all major in history.
- D. None of the above.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Incorrect: The International Association of Archery is not an objective source when it comes to archery since they stand to gain from information about the benefits of archery. Plus, it is not clear where they got their data. You would want to search for a more objective source.
- B. Incorrect: Even though the *Wall Street Journal* is a reputable publication, this article is about only one person. It would be wrong to generalize from her experience to everyone.
- C. Incorrect: Even if the Harvard article is correct, it doesn't mean that taking archery causes students to like history. It could be that students who like archery also happen to like history. One doesn't necessary cause the other.
- D. Correct: None of these sources provide solid backing for Mr. Kirkland's claim.

New School Sport Task #3

Explain to students: *In the sports story in The Investigators, Mr. Kirkland believes that archery will "encourage students to learn about history." Imagine that you want to investigate Mr. Kirkland's claim that archery encourages students to learn history. You type this question into a search engine: Why does archery help students learn history.*

Display PowerPoint and ask students to select an answer:

What's wrong with the question?

- A. It needs to have a question mark at the end.
- B. It is too long.
- C. It should be phrased in a more neutral manner.
- D. It should have quotation marks around it.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Incorrect: A well-phrased question doesn't need a question mark at the end for a browser to understand it.
- B. Incorrect: The way the question is asked is not particularly long.
- C. Correct: You should phrase your questions neutrally. By asking "why does archery help" you are giving a clue to your browser that you only want responses that support the view that "archery helps." Try to phrase questions without leading words like "help" or "hurt" in order to get less skewed results.
- D. Incorrect: To search for an exact phrase, quotation marks are useful. Otherwise, they are less important.

Story 3: School Election

School Election Task #1

Explain to students: *In the election story in The Investigators, the IT guy says that it "seems obvious" that Harry was the one who posted horrible remarks about Jeremy. Which of the following prove that Harry was the one who did it?*

Display PowerPoint and ask students to select an answer:

- A. The computer lab has a seating chart, and Computer 13 is assigned to Harry.
- B. A week ago, the IT guy overheard Harry telling Kim that "Jeremy is a total jerk."
- C. A video that another student took with her phone showing Harry sitting at Computer 13.
- D. None of the above.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Incorrect: Just because Harry is supposed to be sitting in that seat doesn't mean that he was there on that day.
- B. Incorrect: Even if Harry said this about Jeremy, it doesn't mean he was the one who posted the malicious material.
- C. Incorrect: You don't know if the video was taken when the horrible remarks were posted—it could have been taken a month before the incident.
- D. Correct: None of these sources provide conclusive backing for Mr. Kirkland's claim.

School Election Task #2

Explain to students: *In the election story in The Investigators, Harry denies that he was responsible for the nasty social media post about his opponent. Which of the following would offer the strongest evidence that Harry might be telling the truth?*

Display PowerPoint and ask students to select an answer:

- A. You interview Damon who says, "I have known Harry since 1st grade, and he has never ever lied to me."
- B. You analyze all of Harry's social media posts over the past year and none of the "nerd stuff" in the post about Jeremy ever appear.
- C. Harry was named the student with "the best character" in his middle school.
- D. Harry has over a thousand followers on social media, more than any other student in the school.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Incorrect: Harry and Damon are best friends. But that doesn't mean that Harry wouldn't lie to someone else.
- B. Correct: Harry claims the writing style in the post about Jeremy is not his style. If an analysis of the posts he's made in the last year shows no overlap in the vocabulary used, this would be a finding that points toward Harry's innocence.
- C. Incorrect: It's possible that Harry was a great guy in middle school but turned into someone else in high school.
- D. Incorrect: Being popular on social media doesn't necessarily mean that someone is a truthful person.

School Election Task #3

Explain to students: In the election story in The Investigators, even though it's hearsay that Harry is the culprit, Principal Palmer banned him from using computers. When Harry's mom heard this, she became furious and went online to see if the principal's actions are illegal. She landed on the site, www.schoollaw.gov.ru

How should Harry's mom evaluate this site?

Display PowerPoint and ask students to select an answer:

- A. She should inspect the URL before making any definite conclusions.
- B. She should carefully read all the information on the site, beginning with the About page.
- C. She should examine the spelling and grammar on the site.
- D. She should consider whether the site is professionally designed.

Ask students to share which option they chose and to share their reasoning.

Go through the possible answers as a class:

- A. Correct: The URL has .ru after .gov. It is a Russian site, which means that it is unlikely to provide useful information about school law in the U.S. You should always look at the full URL. Scammers will often make tiny changes to the URL to mislead users.
- B. Incorrect: You shouldn't automatically trust an About page. The people who created the website control it, and they usually want to make themselves look as good as possible.
- C. Incorrect: Examining spelling and grammar is not a reliable way to judge a website.
- D. Incorrect: A site's appearance, even if it is perfectly designed, does not provide evidence of trustworthiness.