IS 7 A LOT?

Grades 3-5 (minimum 20 minutes; additional time depends on choice of options)

This activity introduces the concept of "touchstone" numbers and, in developmentally appropriate ways, shows students that context is essential to assessing the validity numbers used in news headlines, social media posts, or other information sources.

BACKGROUND

It is easy to be misled by misinformation if one isn't prepared to pay close attention to statistical evidence. Statistics are fairly easy to manipulate in part because, to many people, numbers appear to be neutral facts. Of course, they are not.

Imagine this sentence in a news report: "Twelve people were persuaded to vote against him." We might have questions about who was doing the persuading, but even more basic, without more context, we can't possibly know the relevance of the number twelve. Is it a lot or a little?

Media makers who want to mislead omit the context in the hopes that we'll be influenced by their inclusion of the statistic and their word choice. And they count on us not to ask questions or notice the omission. This activity makes sure that students won't comply. They'll learn that information sources with numbers and no context are likely misinformation. And, as with all ACT activities, they'll learn to ask media analysis questions.

They'll also be introduced to one more strategy they can use to resist misinformation: touchstone numbers. It's a strategy based on building prior knowledge.

It's not hard to imagine how the sentence referring to twelve votes might have very different meanings. If the twelve people were members of a jury, that would secure a conviction. But if the twelve were the only "no" votes in a statewide election, that would mean almost unanimous victory.

Now imagine that you're a third grader. The fact that you know that twelve jurors or citizens voted isn't adequate context. You'd also need to know that in most cases, twelve would be everyone on the jury (so "12" is a lot!). And though you could probably guess that a whole state would have more than twelve voters (so "12" is a little), you could be certain if you knew how many people voted.

The context number, e.g., the number of people on a typical jury, is the "touchstone" number. Touchstone numbers are numbers to know by heart so that our minds can supply the context when attempts at misinformation omit it. They are most useful when they apply to things with which we are directly engaged – current events, current study topics, current interests.

Because personalization matters for this concept, the activity is designed a bit differently than other ACT activities. There are two initial steps and then a variety of ways for students to apply what they've learned. It's up to you to choose from these options. You could do one, all, or any number in between.

Students will learn

- that numbers without context never tell us the whole truth
- a few "touchstone" numbers

Students will practice (depending on options selected)

- Asking: *Is it a little or a lot? How do I know?* and *What's missing that might be important to know?*
- Online research skills
- Reviewing lessons from other activities on clickbait, news, and choosing responses to misinformation

Materials: Dog Park News handout. It would also be useful to have examples from media that you are already sharing with students (e.g., Newsela or Scholastic News), but if those aren't available or you can't locate articles that include numbers, create some examples of your own or use the examples included in the activity options.

Images

American Paper Companies magazine cover – slide #39
Clickbait chefs – slide #40

Step 1

Pick a number that you can help students visualize. Ask if that number sounds like a lot or a little and how they know. As you probe for evidence, it should gradually become clear that "a lot" or "a little" are relative terms. It depends on what you're comparing it to. We call that "context." Then give a few familiar examples to illustrate:

- Is 7 a lot or a little?
  Seven doesn't sound like a big number, but if it refers to planets in our solar system, that's nearly all of them, so it's a lot. How about if it referred to the number of kids at your school who speak three languages? Or if it was the number of slices of cake you were allowed to have for dessert at dinner tonight?

- Is 64 crayons a little or a lot?
  It's a lot if you compare it to other boxes of crayons, which have 8, 10, or 24. How about if your job was to buy enough crayons for the entire school to use for a whole year?

- If a reporter said, "Attendance at last night's game was 15,000," is that a lot or a little? What would you need to know to answer? (stadium capacity or average crowd size for the team)
  Note: Shifting from suggestion answers to asking what they would need to know is important. Asking that question is how they will notice what's missing and figure out what touchstone numbers are important to know.

Step 2

Distribute copies of the Dog Park News handout.


Daily News

10.04.2023 Sunday edition

COUNCIL MEETING NOTES:

50 Pet Owners Defend Dog Park

When it was time for members of the public to speak, fifty dog owners stood at the microphone. Each asked the council to vote yes.

A few people spoke against the resolution. They did not want the Council to spend money. They said that a dog park was not essential and would not be used by everyone.

Council member Jerome Tompkins showed this chart to explain his "no" vote. Everytown has 50,000 citizens.

Dog Owners in Everytown

The chart showed that nearly half of all households in the town had dogs. "In contrast," she said, "Only ten percent of

Explain that news and other information sources often include numbers. *We just learned that in order to understand the truth from a number, we need to know the context. People who want to mislead us often leave out the context. So one clue we can look for to determine whether a source is reliable or trustworthy*

is to see if includes context whenever it uses numbers.

We're going to practice looking for context by using this sample news story. Invite students to look at the headline and ask, *Is 50 a little or a lot? What would you need to know to answer the question? Let's read the story to see if they give us the context we need to answer.*

Allow students time to read on their own to see if they spot the context, or walk them through by reading aloud one paragraph at a time to determine if the paragraph provides context. (The answer is in paragraph 3. Fifty people was lot of the people who spoke at the meeting, but not a lot compared to the total population of the town).

Pause to ask, *If you were a Council member trying to determine whether there was widespread support for a dog park, would 50 people speaking in favor persuade you? Why or why not?*

Before moving on, de-brief the answers to that question by making sure students understand that their choice might rely on which context they used: The number of people at the meeting, or the number of people in the town.

The article includes other numbers and, depending on time available, review those numbers. Ask if the numbers presented by Dari Dominga were more persuasive than Mr. Tompkins explanation.

The final sentence of the article is the report of the vote: 9 in favor of the park, 2 opposed. To test comprehension, *Ask, Is 9 a little or a lot? How do you know*

If they haven't already figured it out, let students know that this story is fictitious (created specifically for this activity). Sum up by asking, *If you came across a story like this in real life, would you say it is a credible source? What's your evidence? How did the reporter let you know whether 50 (or 9) was a lot or a little?*

Be sure that they understand that it is credible, at least in part, because it gives the context needed to understand the numbers it uses. You might also note that it reports on different perspectives without taking sides, a sign of ethical journalism.

Step 3

Choose from any or all of the options below to introduce touchstone numbers, reinforce the necessity of context, and help students practice.

Option A: General Practice

Share with students familiar examples of information sources that include numbers (e.g., current events resources, text books, infographics). For each example, ask if the number is a little or a lot. Then ask, *What techniques (e.g., words, pictures, graphic layout, punctuation) do the journalists (or authors or media makers) use to indicate that the number they cite is a lot or a little? Do they include the context for the number?* If they don't, model asking, *What's missing that would be important to know?*

Remind students that giving numbers without context is something that often (though not always) indicates that someone is trying to deceive you.

Option B: Trees and Paper Companies

Show the American Paper Companies slide and invite students to analyze it. What would they need to know to determine whether 1,000 was a lot or a little? (A: Perhaps how many trees are in an average forest or a forest that is familiar to them). Is the combination of that number with the claim "Making America greener every day" misleading? (To answer, students would need to know how many trees the paper companies cut down).

Note: This graphic is completely invented. If students research the issue, they'll find that U.S. paper companies plant far more than 1,000 new trees each year. They also cut down more than 100,000.

Option C: Clickbait

For practice, show the clickbait slide and ask, *Is 5 (or 3) a lot or a little? What context information would they need to know for sure?* Add a research practice component by having students investigate how many chefs there are in the U.S. or in the world.
Use the opportunity to review lessons from the "What to Do with Clickbait," or "What Makes a Person an Expert" activities. Or, practice the Share, Challenge, Report, or Skip response choices.

Option D: Student Examples
Invite students to look for their own media examples that include numbers. They can bring their examples to their next library visit and post them in whatever designated spot you assign.

As a group, periodically analyze the students' examples. Use this as a practice asking "What's missing that might be important to know?" or use it as an opportunity to spot the clues provided by the media maker that would indicate if the number is a little or a lot.

Option E: Touchstone Numbers

Step 1
Consult with faculty and/or brainstorm with students a list of numbers that would be good to know in order to be well informed about their community (e.g., the total number of students in their school; the population of the United States, their state, or the world; the number of followers the average person on YouTube has, the cost of commuting to school on public transportation). These should be numbers that they think they might use frequently to evaluate numbers they encounter in media sources. Let them know that they'll learn how to find the numbers they're looking for.

Step 2
Based on the brainstorm list, be prepared to help students learn search techniques and sources to find the number they're looking for. This might include doing a Google search, or looking at Wikipedia, or using a library database, or a website like Wonderopolis – whatever resources you think are important, effective, and are accessible. Be sure to narrate the search techniques you're recommending and the criteria you use to determine that something would likely be a credible source for finding the number they're seeking.

Divide students into teams and assign each a different number to research. Give them a few minutes online to see if they can use the techniques and sources you've introduced to find the number they're looking for. Have them write down the number and its source on index cards (or, if appropriate, on a shared online resource like Google Sheets, Padlet, Wakelet, etc.)

Step 3
Take the activity schoolwide by explaining that you'll combine their touchstone numbers with numbers from other classes. You might also survey faculty to see which touchstone numbers would help their students most.

Tell them you're going to create a poster of these important numbers and next time they come to the library (or class or cafeteria or hallway with a designated bulletin board) they can look for the poster and use it as a reference. Keep the touchstone numbers posted in relevant classrooms or areas of the school so that students see them frequently enough to memorize them.

Alternatively, have the students create the poster, perhaps working with an art teacher.

CURRICULUM CONNECTIONS

Work with students to create data visualizations relevant to their studies (like the charts in the Dog Park article). Discuss what is required for a visualization to be accurate and what sorts of things might distort the chart's appearance (e.g., not using standard measurement in all bars of a bar chart). [math]

Examine mandated curricula with an eye towards building a set of touchstone numbers that would provide important context. For example, how many stars are there? How many in our galaxy? How many can we see from home on a clear night? [science]

Or, at the time of the first Thanksgiving or the Revolutionary War, how many European settlers lived in the colonies (and is that a little or a lot compared with the number of people in Europe or the number of indigenenous people or the total U.S. population now)? How many people are there in the world today? How many of them live in the U.S. (and from a global perspective, is the U.S. population a little or a lot)? [social studies]

Or, what's the daily recommended total intake for added sugar? How does our favorite breakfast compare food compare? [health]

Read Anna Milbourne and Serena Rigiletti's *How Big is a Million?*

AASL Standards Correlations

A. II. 2. Adopting a discerning stance toward points of view and opinions expressed in information resources and learning products.
A. VI. 2. Understanding the ethical use of information technology and media.
A. VI. 3. Evaluating information for accuracy, validity, social and cultural context, and appropriateness for need.

C. II. 2. Contributing to discussions in which multiple viewpoints on a topic are expressed.

D. I. 3. Enacting new understanding through real world connections.
D. III. 1. Actively contributing to group discussions.