The 8-a-Day Challenge:
Healthy Water, Healthy Kids!

TIQ Learning Activity: 6th, 7th or 8th Grade

A weeklong exercise combining inquiry, analysis and communications skills through a student-designed exploration. Two formats are given. (6) (7-8)

Arizona Academic Science Content Standards are noted.

Students will understand how to design and execute an inquiry with tap water as the focus. This learning activity was designed (and student tested!) to combine the AZ Science Standard on Inquiry (S06S1) with the 6th grade emphasis on water as a major focus of study, while students experience and design their own inquiry. The 7th and 8th grade students may use this to learn the inquiry process and scientific method. (S06S1) (S07S1) (S08S1) Your students may work as cooperative groups, or design this as an individual homework assignment. They are challenged to drink eight 8 ounce glasses of tap water daily for one week (7 days), and design their entire inquiry based on the given scenario, including hypothesis, procedure, data log with analysis and communication of results. Sixth grade may wish to use the alternate format (given) and seventh and eighth grades the student-developed inquiry format and directions.

Everything required is here. . . . just add H_2O!

Student Outcomes:

I. Learners will demonstrate their ability to design and conduct an investigation by: (S06S1C1, C2, C3, C4/S06S1C1-2-3-4) (S07-8S1)

- formulating questions based on observation & developing a hypothesis (S06S1C1PO1-2) (S08C1C1PO1)
- selecting resources for use in investigation (S06S1C1PO3/S08S1C1PO2)
- designing a controlled investigation scientifically (S06S1C2PO2/S08S1C2PO2)
- conducting an investigation using trials (S06S1C2PO3/S08S1C2PO3)
- selecting appropriate data collection methods (S06S1C2PO4/S08S1C2PO4)
- recording observations (S06S1C2PO5/S08S1C2PO5)

II. Learners will analyze their results & draw conclusions by: (S06S1C3, C4) (S07/08S1C3/C4)

- analyzing data to identify trends (S06S1C3PO1/S08S1C3PO1)
- forming logical arguments (S06S1C3PO2/S08S1C3PO2)
- evaluating & interpreting data collected (S06S1C3PO5,7/S08S1C3PO3)
- determining validity of investigation results (none 6) (S08S1C3PO5,6,7)
- formulating a conclusion and new questions based on results (S06S1C3PO6) (S08S1C3PO8)

III. Learners will communicate the investigational results by: (S06S1C4) (S07/08S1C4)

- choosing appropriate graphic representation (S06S1C4PO1) (S08S1C4PO1)
- displaying data (S06S1C4PO2) (S08S1C4PO2)
- communicating results by quantitative/qualitative information (S06S1C4PO3) (S08S1C4PO3 and W08-E6-PO1)
- communicating results and conclusion of their investigation (S0S1C4PO5) (S08S1C4PO5)

IV. Learners will review the importance of water to good health by: (S06S4C1PO1)

- examining scientific data (S06S1C3PO1,2,3)(S08S1C3PO1,2,3,7)
- consuming and considering the effects of water on themselves (S06S4C1PO1, 5, 6)

Student and Teacher Directions

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6th-8th Grade/TIQ

SCENARIO: You and your friend have been running 1 mile a day for a couple of weeks now, building up to running a 6K race. You haven't been paying any special attention to drinking water (hydrating) before or after your run or during the day. While reading an article in Fast Teen Magazine* on 6K runs and diet, you notice that the importance of adequate hydration is mentioned a lot in the article, so you mention it to your running partner, Chris. (*not a real magazine)

Chris thinks that you both are doing just fine the way you are, thank you very much, and ignores you! You decide to try what the article suggested, 8 to 10 eight ounce glasses (or sports bottles!) of water per day for a week to see if you notice an improvement in the way you run or feel.

On top of everything else in getting ready for the 6K, your science teacher has asked you to prove you know how to set up a simple experiment all the way from forming an hypothesis to communicating your results. You decide to set up a weeklong investigation with water at the centerpiece, and get out your 16 ounce sports bottles and start to think about how to set this up!

You decide to:

- ✓ drink eight 8 ounce glasses (64 ounces) of water a day –maybe by using four 16 ounce sports bottles, you haven't decided that yet.
- ✓ use tap water, 'cuz it's cheap, easy, convenient and you like to freeze your sports bottle to have cold water all day as it thaws, and you have it at school in the drinking fountain or science room faucet.
- ✓ group with 3-4 other students to do this, or go it alone, your choice.
- ✓ outline the entire experiment first to make sure you know what is needed for a scientific inquiry.

So you answer the following:

1. **Questioning**: What do I want to find out by drinking 64 oz. of tap water per day for one week?_____
2. **My hypothesis**, or a statement of what I believe may occur by doing this:_____
3. What **resources** do I need to do this?_____
4. How do I **design this so it's scientific**, the way I've learned about using the Scientific Method?_____
5. How will **my trial water test** be set up?_____
6. How will I **gather the data**? What will my **data log** look like? And how will I record my results?_____
7. Using my **data**, I'll **analyze** it, looking for **trends, or data that match**.
8. I'll **explain** what I find **logically**.
9. I'll **analyze if it matches or does not match** my stated **hypothesis**.
10. *(8th Grade)* I'll decide if it's a **valid study** or not. (Was it long enough, were there enough people involved? Were there enough samples? Did I have a control for it? etc.)
11. When I've got my **data shown and analyzed**, I'll **communicate my results** in a **report** with the **conclusions of my research**.

OPTION: The 8-a-Day Challenge:
Healthy Water-Healthy Kids!

For students requiring a different more basic format, the following can be adapted to your classroom needs. The inquiry is divided with a data log for the week. The scenario can remain the same! This is designed to walk students through the basic protocol for setting up an experiment as they experience it first hand, (and not necessarily to gain valid results), it's more process than product that's important in this activity!

QUESTIONS you want answered:

- Will I feel different if I drink 64 ounces of water a day?
- Will I feel better, the same, or worse?
- How am I going to keep track of this for a week?

HYPOTHESIS: "By drinking eight 8 ounce glasses of tap water a day (64 ounces) for one week I will notice a difference in how I feel."

or

HYPOTHESIS: "By drinking eight 8 ounce glasses of tap water a day (64 ounces) for one week I will not notice a difference in how I feel."

(Select one hypothesis for your experiment.)

RESOURCES: Tap water (iced, cold, room temperature, with lemon twist or without, decide how you want to drink it), container (sports bottle or something you can drink from easily during lunch breaks at school and all day) Measure how many ounces it contains and decide how many you'll need. Notebook, pen, pencil, computer, whatever you need to keep track of your assignment.

DESIGN: Use the Data Log given and keep track of how you are feeling as you exercise, walk, attend school or take part in activities during the week. You'll have to keep it close at hand during the day. At the end of the week, answer the questions and write your final report to communicate what you think the results were from your experiment.

HINT: To keep track of how much you drink, first measure your container. (Perhaps you have a 16 ounce sports bottle. You will need to drink 4 of these to equal 8 eight ounce glasses or 64 ounces.) Put 4 rubber bands on the sports bottle. Each time you drain a bottle, take off a rubber band! It's that easy to keep track! Just make sure you do the math carefully!

DATA LOG: Use the data log for 7 days and make an "x" or check mark in the appropriate day's box and use the comments table to make sure you make note of how you are feeling during each day: is it about the same as you felt before the experiment? Have you noticed any differences that you might be able to label as "better", "worse" or it is "about the same"? Were you thirsty? Not thirsty during the week? More energy, about the same or less? Anything different at all? Be specific, make notes throughout the day!

TAP INTO QUALITY

AFTER THE WEEK IS OVER:

- Look at the DATA LOG and COMMENTS. Do you notice any descriptions that are the same all seven days? What are they? That might indicate a data trend, which is something that is the same throughout the experiment. Did you find any?

- Now in an organized and logical way, look at it and analyze whether what you found matches or does not match the hypothesis you selected. It's OK if it doesn't!

- (8th grade only) Was it a valid study? That is, do you think it was long enough to get enough data? Were you able to compare it to a week of not adding 64 ounces of water to your regular diet? Could you really tell a difference in how you felt because of the extra water? If so, make sure you can describe that and your data shows that.

- Are there any other questions that you can think of you'd like to ask if you did this again? What are they?

Now take the answers that you found from these questions, and write up a short report telling what you found. This will be the conclusion to communicate what you found by experimentation!

Outline it here and do your editing before writing up a final copy:

TAP INTO QUALITY

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DATA LOG

Put a check mark or an 'x' in a box when you finish water for that specific day!

DAY	SUN	MON	TUES	WED	THURS	FRI	SAT
8 oz.							
8 oz.							
8 oz.							
8 oz.							
8 oz.							
8 oz.							
8 oz.							
8 oz.							
TOTAL 64 oz.	TOTAL oz.	TOTAL oz.	TOTAL oz.	TOTAL oz.	TOTAL oz.	TOTAL oz.	TOTAL oz.

Make notes through the day, morning, afternoon, evening.
Do more than a few a day!

DAY OF THE WEEK	COMMENTS: "How I felt, and what I noticed by adding water."
SUNDAY Date:	
MONDAY Date:	
TUESDAY Date:	
WEDNESDAY Date:	
THURSDAY Date:	
FRIDAY Date:	
SATURDAY Date:	

What was your favorite way to drink tap water?_____
(Room temperature, with ice or cold . . . with a twist of lemon or plain?)