



Smarter Balanced Assessment Consortium:

Mathematics Practice Test Scoring Guide
Grade 7 Practice Test

10/2/2015



USING WATER WISELY

Water is a valuable resource that can easily be wasted. In this task you will investigate how much water the average American uses each day. You will then investigate how much water a family of 4 could save using different strategies.

According to some estimates, the average American uses 80–100 gallons of water daily. Of this total, the average American uses about:

- 27% by flushing toilets
- 25% while taking showers/baths
- 10% by running the faucet while brushing teeth, washing hands, and shaving

Water is also used for various other purposes (cooking, drinking water, watering plants, washing clothes, etc.) that account for the remaining percentage of water used by the average American.

Table 1 shows the average amount of water used during some activities.

Table 1. Water Used by Activity and Duration

Activity	Duration	Amount of Water Used
Showering	11 minutes	20–25 gallons
Running water in bathtub while waiting for water to get hot	$\frac{1}{2}$ minute	3 gallons
Leaky faucet	1 second	2 drips*

*There is no standard definition of the volume of a faucet drip, but the USGS Water Science School uses $\frac{1}{4}$ milliliter (mL) as the volume of a faucet drip. So, by these drip estimates:

- One gallon = 15,140 drips
- One liter = 4,000 drips

Item	Claim	Domain	Target	DOK	Content	MP	Key
#1	2	RP	A	2	6.RP.A	1,2	38

2059



What percentage of the average American's daily water usage is described as "various other purposes"?

← → ↶ ↷ ✖

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 38

Rubric: (1 point) The student enters the correct percentage.

Item	Claim	Domain	Target	DOK	Content	MP	Key
#2	2	RP	A	2	7.RP.1	1,2	6

2060



How many gallons per minute of water are used by running water in the bathtub while waiting for it to get hot?

Enter the unit rate in **gallons per minute**.

←
→
↶
↷
✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 6 or its equivalent

Rubric: (1 point) The student enters a correct unit rate.

Item	Claim	Domain	Target	DOK	Content	MP	Key
#3	4	RP	A	2	7.RP.3	1,2,6	See Exemplar

2061



Now, you will start investigating ways to save water. Taking shorter showers is one way to save water.

What is the range for the amount of water, in gallons, that is saved if a shower lasts for 5 minutes instead of 11 minutes?

Exemplar: “A 5-minute shower would save 10.9 to 13.6 gallons of water compared to an 11-minute shower.”

Rubric:

(2 points) The student response includes a correct range of values. The lower end of the range should be from 10.9 to 11 and the upper end of the range should be from 13.6 to 14.

(1 point)

- The student enters a range of what is being used, not saved (e.g., 9.09 to 11.36 gallons).
- OR
- The student finds the difference in the range values (e.g., 2.27 gallons)

This item is not graded on spelling or grammar.

Item	Claim	Domain	Target	DOK	Content	MP	Key
#4	4	RP	A	2	7.RP.3	1,2,6	11

2062



One of the most common causes of wasting water at home is a leaky faucet. It may seem insignificant but the little drips can actually add up.

Assume that a leaky faucet drips 2 times per second.

How many gallons of water will be saved in a **24-hour day** if the leak is fixed? Enter your answer to the nearest whole gallon.

←
→
↶
↷
✖

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 11

(2 points) The student enters the correct or equivalent value.

(1 point)

- The student enters the number of drips of water saved in one day. (172,800)
OR
- The student rounds incorrectly.

Item	Claim	Domain	Target	DOK	Content	MP	Key
#5	3	RP	B	3	7.RP.3	1,2,3,6	See Exemplar

2063



Consider an average American household of 2 people.

For this household, what is the range for the number of gallons of water used in one day just from running the faucet while brushing teeth, washing hands, and shaving? Explain your answer using mathematics.

Exemplar: “In a household of 2 people the water usage is 160 – 200 gallons per day. So, 16 to 20 gallons of water is wasted since 10% of the water used is for running the faucet while brushing teeth, washing hands and shaving.”

Rubric:

(2 points)

- The student response identifies a reasonable range for a household of 2, considering the water wasted should be about 10% of the normal water usage (e.g., 16 to 20 gallons of water per day).

AND

- The student supports their response with correct mathematics.

(1 point)

- The student makes a computation error, but shows understanding of how to find the percent of a number.

OR

- The student forgets to double the range in the end (8-10 gallons), or does not double the range correctly.

OR

- The student provides a correct range, but used incorrect mathematics or an incoherent explanation.

- The student does not supply a range of values, but a value that falls within the range of 16-20.

This item is not graded on spelling or grammar.

Item	Claim	Domain	Target	DOK	Content	MP	Key
#6	3	RP	F	3	7.RP.3	1,2,3,6	See Exemplar

2064



People can save water by taking some proactive steps. Consider an average American household of 4 people.

Explain how much water, on average, can be saved each day if they implement the following plan:

- They fix one leaky faucet in the home that drips about 2 drips per second.
- Each person reduces the time in the shower by 3 minutes.
- Each person does **not** leave the water running while brushing teeth, washing hands, and shaving.

Support your answer by including the average amount of water saved by implementing each part of the plan, as well as the total amount saved.

Exemplar: “From question 4, I found that the leaky faucet described will waste 11 gallons a day. If the leak is fixed, 11 gallons will not be wasted each day.

If each person reduces their time in the shower by 3 minutes, and there are 4 people, overall that’s 12 fewer minutes spent in the shower. Using the relationship of 11 min = 20 – 25 gallons used, we can find that 1.8 – 2.3 gallons are used per minute so about 22 – 27 gallons will be saved.

If a person does not leave the water running while brushing teeth, washing and shaving, 10% of 80-100 gallons per day will be saved. This means each person saves 8 – 10 gallons each day. For 4 people, that would be 32 – 40 gallons saved each day.

Combining all the gallons saved, 11 gallons from the faucet, 22 – 27 gallons from the shower, and 32 - 40 gallons from brushing their teeth, shaving and washing hands, about 65 – 78 gallons can be saved each day if they make the changes in the plan.”

Rubric:

A response that calculates correctly using the answer from question 4 should receive full credit, even if the answer in question 4 is not correct.

(3 points)

- The student response includes correct calculations for all of the following:
 - The student uses their response from question 4 or tells that fixing a leaky faucet will save 11 gallons of water a day.
 - The student finds how much water is saved by reducing shower time by 3 minutes for 4 people (22-27 gallons).
 - The student finds that not leaving the water running will save 32-40 gallons per day for 4 people (or 8-10 gallons per person).
 - The total water saved from adding these three amounts.

(2 points)

- The student response includes exactly 3 correct calculations of the following:
 - The amount of water saved from fixing the leaky faucet (or uses their response from question 4).
 - The amount of water saved from reducing the shower time (per person or for 4 people).
 - The amount of water saved from turning off the faucet (per person or for 4 people).
 - The total water saved from adding these three amounts.

(1 point)

- The student response includes exactly 2 correct calculations of the following:
 - The amount of water saved from fixing the leaky faucet (or does not use their response from question 4)
 - The amount of water saved from reducing the shower time (per person or for 4 people)
 - The amount of water saved from turning off the faucet (per person or for 4 people)
 - The total water saved from adding these three amounts.

This item is not graded on spelling or grammar.