

# Calories in, Calories Out Word Problem

There are many misconceptions surrounding the concept of calories. This lesson will introduce students to the role of calories in healthy living and the management of calorie intake/output in regards to reaching and maintaining a healthy weight.

## SUBJECTS



NUTRITION



SCIENCE



MATH



LANGUAGE  
ARTS

**STEM Aligned**

## GRADE LEVEL

**4-5**

## TIME

**45 min**

# Calories In, Calories Out

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## Objectives

- Students will explain what a calorie is and what it means in terms of food eaten and activities performed
- Students will calculate whether someone has gained or lost weight
- Students will determine and discuss, with scaffolding, themes and/or characters (i.e. compassion, and bullying) and how they relate to their own feelings and experiences; they can also compare and contrast these themes and other books

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## Materials & Preparation

- Calculators (unless you prefer that they calculate the amounts on paper)
- Copies of the handout “Calories In, Calories Out”
- This activity will require classroom space for small groups of students to complete the following activities in stations: lying down on the ground, walking in circles (or back and forth a short distance), jumping jacks, running in place, and sitting on chairs

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## Common Core Standards

- RL.4.2. Determine a theme of a story, drama, or poem from details in the text; summarize the text.
- RL.5.2. Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.
- M.4.NBT. Fluently add and subtract multi-digit whole numbers using standard algorithm.
- M.5.NBT. Fluently multiply multi-digit whole numbers using standard algorithm.

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## STEM Alignment

- Reason abstractly and quantitatively
- Make sense of problems and persevere in solving them
- Model with mathematics
- Constructing explanations and designing solutions
- Using mathematics and computational thinking

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## Lesson Introduction

1. Tell students they will be learning about what a calorie is and its role in healthy living. To kick off the lesson, they are going to rotate through five different activities at five different stations.
2. Demonstrate the five stations:
  - Lying down pretending to sleep
  - Walking in a small circle (or back and forth a short distance)
  - Jumping jacks
  - Running in place
  - Sitting in a chair pretending to watch television
3. Split students into five groups and assign each group to begin at one of the five stations. Students will stay at each station for one minute. Call/signal “time” every 60 seconds, with a short passing period, as they move to the next station.
4. Once students have rotated through all five stations, announce that during this activity they burned approximately 15.8 calories.
5. Write the following on a chalk/whiteboard:
  - Sleeping = 0.6 calories
  - Walking = 2.5 calories
  - Jumping jacks = 6 calories
  - Jogging = 6 calories
  - Watching television = 0.7 calories

## Body of Lesson

6. What is a calorie?
  - Think-Pair-Share: Have students discuss their predictions about the question: “What is a calorie?” Next, have students discuss their answer with a partner and share some ideas with the class.
  - Define a calorie as: a unit to describe the amount of energy stored in a food, and the amount of energy used performing an activity... even sleeping! We need calories to keep our hearts pumping, our lungs breathing and our mind working. We also need them to move our bodies from one place to the next. In other words, we need calories to stay alive.
7. You may hear people talking about calories when they are trying to lose weight. People gain weight when they eat more calories than they burn,

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and they lose weight when they eat fewer calories than they burn. “What would somebody have to do in order to never gain or lose weight?”

Answer: The number of calories they ate would have to equal the number of calories they burned.

8. Read a related book such as “Nothing’s Fair in Fifth Grade” by Barthe DeClements or “The Berenstain Bears and Too Much Junk Food” by Jan and Stan Berenstain.

## Calorie word problem

1. Tell students they will complete a math word problem to calculate if someone has gained, lost or maintained his weight. Distribute the Calories In, Calories Out handout.
2. State: Terry is a high school senior on the basketball team. She has been eating healthy, working hard at practices, and has reached a weight at which she feels strong, fast and confident. The Calories In, Calories Out handout lists foods Terry ate yesterday and the number of calories in those foods. It also lists the activities Terry performed and the number of calories burned doing those activities. If Terry’s goal is to maintain her current weight, is she on track?
3. Using the charts in the handout, students calculate the number of calories eaten and the number of calories burned. Answer: 2057 calories eaten; 2204 calories burned.
4. Explain that the calories burned are based on Terry’s weight of 100 pounds. People who weigh more would burn more calories because more energy is required to move a larger body around and keep them alive; people who weigh less would burn fewer calories because less energy is required to move them around and keep them alive.
5. To calculate if Terry gained or lost weight, one must: subtract the number of calories eaten from the number of calories burned. In the case of our word problem:  

$$2057 \text{ calories eaten} - 2204 \text{ calories burned} = -147$$
 The negative number means she burned more calories than she ate.  
 Ask: “So did she gain or lose weight?”  
 Answer: She lost weight.
  - **Note:** Depending on the math level of students, you can also calculate how many pounds of fat she lost. There are 3500 calories in 1 pound of fat.

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To calculate fat lost or gained, divide the difference between the calories burned and eaten by 3500. In the case of our word problem, it would look like this:  $-147 / 3500 = -0.042$  pounds of fat. Have students check their work with multiplication.

6. Ask: "If Terry wanted to make sure that she didn't lose weight, what would she have to do?" Answer: eat more food (consume more calories) or do less activity (burn fewer calories.) Another option would be to eat foods higher in calories.
7. Explain that some foods have more calories than others. For example,  $\frac{1}{2}$  cup of apple slices has fewer calories (60 calories) than  $\frac{1}{2}$  cup of French fries (350 calories.) If someone were trying to gain or lose weight, not only can they change how much they eat, but also what they eat.

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## Conclusion

8. In conclusion, gaining weight and losing weight is a numbers game, and it is a numbers game you can play. Tie this into the theme of stories, compassion, and bullying. There are several websites you can use to keep track of the calories you eat and the calories you burn. Try the U.S. Department of Agriculture website [choosemyplate.gov](http://choosemyplate.gov).

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## Extension

- Non-fiction current event reading or research about obesity and what it is costing society (emotionally and fiscally).
- Use the books "The Digestive System" by Christine Taylor-Butler or "Good Enough to Eat" by Lizzy Rockwell to connect to and come up with solutions to the characters' problems.



# Calories In, Calories Out Handout

<b>Hours</b>	<b>Activity Performed</b>	<b>Calories Burned (for 100 lb. person)</b>
8	Sleeping	327 calories
2	Watching television	130 calories
6.5	Sitting at a desk at school	531 calories
1.5	Sitting/eating	102 calories
1	Walking to/from school	136 calories
2	Playing basketball	726 calories
1	Sitting while doing homework	81 calories
1	Getting ready in the morning/for bed	90 calories
1	Sitting/reading	81 calories
24 hours		Total Calories Burned = ???