

YUM, BUBBLE GUM

Sink your teeth into this fun lesson using science and math. Students will conduct experiments on bubble gum performance and have a “Chomper Challenge.” Teachers will be asked to gum.

Kansas College and Career Ready Standards for Math:

- 6.NS.2 Fluently divide multi-digit numbers using an efficient algorithm.
- 7.NS.3 Solve multi-step real-life and mathematical problems with rational numbers. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.

Kansas College and Career Ready Standards for Science:

- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Classroom teacher provides:

- **Bubble Gum Physics pages- one set per student**
- **Calculator – one per student**
- **Pencil – one per student**
- **One piece of bubble gum for each student (This can be sugar-free if desired)**
- **Bubble Gum Experiment pages – one set per student**

Additional supplies for student experiments will be needed. Supplies will vary depending on what the students are trying to test (such as which brand blows the largest bubble, which gum stretches the farthest, which brand holds its flavor the longest, etc.) Teachers can ask students to supply the gum for their experiments. Experiments will be started during the IDL session and finished later in class.

During the “Yum, Bubble Gum” IDL program, we will be doing the following activities and students will need the corresponding materials:

Activity

Supplies

Chomper Challenge

Student pages
Calculator
Pencils
One piece of gum per student

Speedy Chompers

Student pages
Calculator
Pencils
Gum from first activity

Bubble Gum Experiment

Student pages
Pencils
Additional supplies for student experiments will be needed once students have determined what they will be testing.

Program Connection Information

Please use an external microphone (conference style) rather than the integrated one in the computer for the audio for your class and locate it centrally in the room. It can be difficult for the Greenbush teacher to hear the students using the computer microphone and therefore it reduces the interactive nature of the lesson. It is fine to use the computer webcam for your video source though.

All classes will take place using Zoom desktop video. If your building is already set up to use a desktop video application with a computer, simply open a browser and enter <https://zoom.us/j/3662120241> in the URL space. You may need to download Zoom launcher software (free download) if you don't already have it. This needs to be done in advance of the lesson.

If using a Polycom video conferencing unit (or any legacy type video conferencing unit) to connect to a ZOOM conference, make sure the unit is in "encrypted mode" then dial the following IP on the internet: 162.255.37.11 or 162.255.36.11 and once connected, they will ask for a MEETING ID: enter 3662120241 (for Sharon at Science Center).

It's always a good idea to touch base with your district technology facilitator prior to your program to make sure all systems/equipment are in place and operational and no firewalls that might prevent you from connecting to Zoom.

Classes take place at the following times:

9:00-9:45
10:00-10:45
12:15- 1:00
1:15-2:00
2:15-3:00

If you log in during one of those times, you may connect during another class' lesson. If you do, please check your connection to make sure things are working properly and then leave the meeting until your scheduled time by selecting "End Meeting" in the lower right corner of your Zoom screen and click on "End Meeting". You will need to rejoin the meeting at your scheduled time. This prevents your site from interfering with the lesson currently in progress. After your lesson is finished, please leave the meeting.

If you have questions, please call Sharon Bertolio at Greenbush (620-724-6281).

Bubble Gum Physics

Name _____

Obtain a piece of bubble gum from your teacher and start chewing to get ready for the experiments!

Part A: Chomper Challenge

(1) For this experiment, you will conduct five trials to determine the number of chomps you can do in 30 seconds. A chomp is defined as a “big chew”, or the kind that usually causes you to get caught with gum!

(2) Use a timer to determine the number of chomps you can do in 30 seconds. Record your data in the chart. Repeat the same process for the other trials.

Trial	Chomps	Time	Speed
1			
2			
3			
4			
5			

Speed = # of Chomps ÷ Time
Round speeds to the nearest hundredth!

(3) What is your average speed? Round answers to the hundredth. _____ chomps/second

(4) Based on your average chomping speed, how many chomps could you do in five minutes, one hour, or one day? Show your work!

5 min = _____ chomps 1 hour = _____ chomps 1 day = _____ chomps

Part B: Speedy Chompers

(1) Use a timer to determine the number of chomps you can do in 1 minute. As the time reaches each point, record the number of chomps you have completed. Do not stop the timer as you record your data. You may want to practice a few times before running an “official” trial.

Time	Chomps
20 sec	
40 sec	
60 sec	

(2) Calculate your chomping speed at each point (20 sec, 40 sec, and 60 sec) using the data from your experiment. Show your work! Round all answers to the nearest hundredth!

Speed at T = 20 sec = _____ chomps ÷ 20 sec = _____ chomps/sec

Speed at T = 40 sec = _____ chomps ÷ 40 sec = _____ chomps/sec

Speed at T = 60 sec = _____ chomps ÷ 60 sec = _____ chomps/sec

(3) Did you maintain a constant rate? Explain.

Think About It!

Write a paragraph to summarize the results of your experiments.

Are your results accurate and reliable? Why or why not?

What other experiments could you do with bubble gum?

Name _____

Date _____

Bubble Gum Experiment

What is your problem (in question format)? *Remember, no pronouns (I, we, etc).*

Write a hypothesis explaining what you think will happen in your experiment.

What materials will you require for your experiment? *(Make a list w/ amounts)*

Variable:

Additional Lesson Resources

Fascinating facts about the invention of Bubble Gum by Walter Diemer in 1928

AT A GLANCE:

In 1928, Walter Diemer was working as an accountant for the Fleeer Chewing Gum Company in Philadelphia; what he wound up doing in his spare time was playing around with new gum recipes. But this latest batch was less sticky than regular chewing gum and it stretched more easily. His bubble gum was so successful that it sold over a million and a half dollars worth of gum in the first year. .

Invention: bubble gum

Definition: Bubble gum is a type of chewing gum that is especially designed for blowing bubbles. It is usually pink in color and has a particular flavor.

Patent: Walter Diemer never patented his invention.

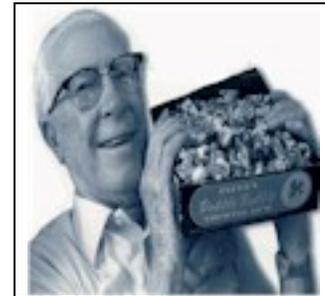
Inventor: Walter E. Diemer

Criteria; First successful, modern prototype.

Birth: January 5, 1904 in Philadelphia, Pennsylvania

Death: January 9, 1998 in Lancaster, Pennsylvania

Nationality: American



The Story:

In 1928, bubble gum was invented by a man named Walter E. Diemer. Here's what Walter Diemer, the inventor himself, said about it just a year or two before he died: "It was an accident." "I was doing something else," Mr. Diemer explained, "and ended up with something with bubbles." And history took one giant pop forward. What Mr. Diemer was supposed to be doing, back in 1928, was working as an accountant for the Fleeer Chewing Gum Company in Philadelphia; what he wound up doing in his spare time was playing around with new gum recipes. But this latest brew of Walter Diemer's was -- unexpectedly, crucially -- different. It was less sticky than regular chewing gum. It also stretched more easily. Walter Diemer, 23 years old, saw the bubbles. He saw the possibilities. One day he carried a five-pound glop of the stuff to a grocery store; it sold out in a single afternoon.

Before long, the folks at Fleeer were marketing Diemer's creation and Diemer himself was teaching cheeky salesmen to blow bubbles, to demonstrate exactly what made this gum different from all other gums. The only food coloring in the factory was pink. Walter used it. That is why most bubble gum today is pink. Gilbert Mustin, President of Fleeer named the gum Dubble Bubble and it controlled the bubble-gum market unchallenged for years, at least until Bazooka came along to share the wealth. Walter Diemer stayed with Fleeer for decades, eventually becoming a senior vice president.

He never received royalties for his invention, his wife told the newspapers, but he didn't seem to mind; knowing what he'd created was reward enough. Sometimes he'd invite a bunch of kids to the house and tell them the story of his wonderful, accidental invention. Then he'd hold bubble-blowing contests for them.

ON THE WEB:

[Dubble Bubble History](#)

(URL: <http://www.gumball.com/history-of-dubble-bubble.aspx>)

[Bazooka Bubble Gum](#)

Bazooka, with its distinctive name, taste, and red, white and blue logo and packaging, soon became a familiar part of Americana. The taste and smells that bring back memories.

(URL: <http://topps.com/Confectionery/Bazooka/index.html>)

[Bubble Gum](#)

Lots to see and do at this Amurol Confections Company site, makers of Hubba Bubba bubble gum.

(URL: www.bubblegum.com/)

[Facts About Gum](#)

The first patent for chewing gum was issued in 1869 to William F. Semple, a dentist from Mount Vernon, Ohio. A ThinkQuest student report.

(URL: <http://library.thinkquest.org/J0113191/facts.htm>)

WORDS OF WISDOM:

"I've done something with my life. I've made kids happy around the world." - Walter Diemer

DID YOU KNOW?:

- Dubble Bubble gum was so successful that the Fleece Company sold over a million and a half dollars worth of gum in the first year.
- Today, the average American chews 300 sticks of gum a year.
- Did you know that chewing gum has been around for over 900 years?
- Many doctors, however, said it was unhealthy. In 1869, one wrote that chewing gum would "exhaust the salivary glands and cause the intestines to stick together."
- A leading columnist on the subject of etiquette tells a reader asking about chewing gum in public that it is perfectly all right to do so as long as it isn't done with too much gusto.
- In the United States alone, there are about 20 chewing gum manufacturers, with the Wrigley Company being the largest.
- In the United States, total retail sales of chewing gum (including bubble gum) is over \$2.0 billion.
- They can't make chocolate-flavored chewing gum. Unfortunately, the cocoa butter in chocolate acts as an emulsifier on chewing gum base, making it extremely soft, negatively affecting the chewing quality of the product.
- **But why is bubble gum pink? Bubble gum is pink because when the big moment arrived, when destiny came calling on Walter Diemer, pink was the one and only shade of food coloring he had nearby.**