Acetaminophen Dosage Chart

Children's Chewable Acetaminophen*			
Weight (lb)	**Weight (kg)**	**Age (yr)**	**Dose**
under 24	under 11	under 2	consult doctor
24–35	11–16	2–3	2 tablets
36–47	17–21	4–5	3 tablets
48–59	22–27	6–8	4 tablets
60–71	28–32	9–10	5 tablets
72–95	33–43	11	6 tablets
*1 tablet = 80 milligrams.			
Warning: Take no more than five doses per day.			

A Poisonous Dose? The Case History

Date: February 25

Patient: Andy Brown

Age: 2 years old

Weight: 26.5 lbs (12 Kilograms)

Symptoms: stomach upset, nausea, vomiting, fever

Current medicines: 1 teaspoon liquid acetaminophen 4 times a day

Action taken: Admit Andy to hospital (February 25), blood work ordered

Notes: Andy was sick with a fever when his mother was called out of town on business. Andy went to stay with his aunt. The mother left some Children's Suspension Liquid Acetaminophen to use for Andy's fever, but it ran out. On February 24, the aunt began to use her own Infants' Concentrated Drops, giving Andy 1 teaspoon every 4 hours, just like she did with the children's acetaminophen. In total, the aunt gave Andy 4 doses of infants' drops.

Lab Results: High levels of acetaminophen found in the blood

Diagnosis: Acetaminophen overdose and poisoning, which can lead to liver damage and death (an overdose of acetaminophen is 150 milligrams per Kilogram of body weight. Andy weighs 12 Kilograms, so 1,800 milligrams of acetaminophen is an overdose)

Treatment: Within 8 to 12 hours, administer antidote (Done: February 25)

Prognosis: Good (Feb. 25)
Updated to excellent (Feb. 26)

Follow-Up: Talk to Andy's aunt and mother: Infants' Concentrated Suspension Drops is more than three times stronger than Children's Suspension Liquid even though the two formulas look similar. Parents and caregivers should always read the dosage chart on the medicine bottle to ensure that they are giving the proper dosage. It is also important never to use a different unit of measurement than the one indicated on the dosage chart (such as a teaspoon instead of a dropper) to administer medicine.

A Poisonous Dose? The Problem

Your teacher will display a transparency of a doctor's chart. Read the first page of the doctor's chart that describes Andy Brown's case. Then use information provided on the transparency and on this worksheet to answer the following questions.

Part I
How much Infants' Concentrated Suspension Drops did Andy receive from his aunt?

a. 1 teaspoon
b. 1 teaspoon 4 times in 1 day
c. 3 teaspoons
d. 4 teaspoons
e. b and d
f. none of the above

Use the dosage chart below to calculate how much acetaminophen, in milligrams (mg), Andy's aunt gave him in one day. Remember, Andy's aunt gave Andy his medicine in a teaspoon. To use the dosage chart, you need to know that each teaspoon contains 6.25 dropperfuls of medicine.

$$4 \text{ teaspoons} \times \frac{6.25 \text{ dropperfuls}}{1 \text{ teaspoon}} \times \frac{\square \text{ milligrams}}{1 \text{ dropperful}} = \square \text{ milligrams of acetaminophen}$$

Infants Concentrated Suspension Drops*			
Weight (lb)	**Weight (kg)**	**Age (yr)**	**Dose**
under 24	under 11	under 2	consult doctor
24–35	11–16	2–3	2 dropperfuls
*1 dropper = 0.8 milliliter = 80 milligrams			
Warning: Take no more than five doses per day.			

The warning on the dosage chart says that a child should take no more than five doses of Infants' Concentrated Suspension Drops in one day. How many milligrams of acetaminophen would there be in five doses for a child Andy's size?

$$5 \text{ doses} = 10 \text{ dropperfuls} \times \frac{\square \text{ milligrams}}{1 \text{ dropperful}} = \square \text{ milligrams of acetaminophen}$$

Conclusion to Part I
What do you think is making Andy sick?

Part II

When Andy's mother gives him a pain reliever, she usually gives him Children's Suspension Liquid. Use the chart below to calculate how many milligrams of acetaminophen a boy Andy's size would get in four doses of Children's Suspension Liquid.

4 doses = 4 teaspoons x $\frac{\square \text{ milligrams}}{1 \text{ teaspoon}}$ = $\square$ milligrams of acetaminophen

Children's Suspension Liquid*			
Weight (lb)	**Weight (kg)**	**Age (yr)**	**Dose**
under 24	under 11	under 2	consult doctor
24–35	11–16	2–3	1 tsp.
36–47	17–21	4–5	$1\frac{1}{2}$ tsp.
48–59	22–27	6–8	2 tsp.
60–71	28–32	9–10	$2\frac{1}{2}$ tsp.
72–95	33–43	11	3 tsp.
*1 teaspoon = 5 milliliters = 160 milligrams.			
Warning: Take no more than five doses per day.			

What does Andy's mother use to measure a dose of Children's Suspension Liquid? (Circle one.)

a teaspoon a dropper

What did Andy's aunt use to measure Andy's doses of Infants' Concentrated Suspension Drops?

a teaspoon a dropper

What does the dosage chart for infants' drops say should be used to measure the medicine?

a teaspoon a dropper

Conclusion to Part II

Andy received an accidental overdose of acetaminophen. On a separate piece of paper, describe how you think the mistake happened.

Parent Letter

Dear Parents,

Next week in science class we will be investigating individual responses to caffeine. Each student will need to bring in a 12-ounce can of _____. Please provide a can and label it with your child's name and class period.

During the investigation, students will consume 12 ounces of the caffeinated soft drink and measure what effect it has, if any, on their heart rates.

Students are not to bring in any soft drink other than the one specified. Students who do not bring in a drink, or those without permission to drink a soft drink during science class, will be the "control" in the investigation and will drink 12 ounces of water. In this way, everyone can take part in the investigation.

Thank you for your continued support.

_____
Teacher's Signature

_____ My child, _____, has permission to participate in the caffeine investigation in science class and will bring in a 12-ounce can of _____ to consume as part of the activity.

_____ My child, _____, will not participate by consuming a 12-ounce soft drink, but will participate in the activity as a control by drinking the same amount of water.

_____ _____
Parent's or Guardian's Signature Date

The Chemical Caffeine: How Do You Respond?

Materials for Each Team
2 cans of caffeinated soft drink (1 for each student)
1 watch or classroom clock with a second hand
data table (provided with these instructions)
pencils

Procedure
Do Steps 1–3 with your teacher.

1. When your teacher directs you to do so, find your pulse. You can find it most easily by pressing two fingers against the artery in your neck or on the inside of your wrist. Practice counting the beats.

2. When your teacher directs you to start, count the number of beats you feel in 15 seconds. Your teacher will tell you when to stop. Record the number in the first column of the data table on the next page.

3. Multiply the number of beats you counted in 15 seconds by four to calculate the number of beats you would have counted in one minute. This number is your resting heart rate. Record your resting heart rate on the data table.

With your partner, complete the rest of this investigation.

4. What do you think might happen to your heart rate after you drink a caffeinated soft drink? Write your prediction here:

   _____

   _____

5. Together, at the same time, drink the cans of soft drink. For best results, try to drink them quickly, taking no more than 10 minutes to finish the can. Write the name of the soft drink at the top of your data table.

6. Sit at rest for about 5 minutes. You can talk to your partner, but keep your body still so that you do not elevate your heart rate with activity. If your teacher instructs you to do so, read quietly at your seat.

7. One partner at a time, measure your heart rate for 15 seconds. To do this, have one partner be the counter and find his or her pulse. Have the other partner be the timer and watch the second hand on a watch or on the classroom clock. Have the timer say "Start" and "Stop" at the beginning and end of 15 seconds while the counter counts his or her beats. Record the number of beats in your data table in the first column of row 1. Repeat the procedure so that the other partner can count his or her heartbeats in 15 seconds.

8. Once every two minutes, repeat Step 7, until you have measured the number of heartbeats in 15 seconds at least 10 times. Record each measurement in the first column in your data table.

9. From each of your measurements, calculate your heart rate after drinking caffeine by multiplying the number of beats you counted by four. Record your heart rate for each measurement in the final column of your data table.

10. Using the highest number you calculated for heart rate after drinking a soft drink, determine the difference between your resting heart rate and your heart rate after drinking a caffeinated soda. Record that number below the data table. Then, calculate the number of minutes it took after finishing the drink for your heart rate to reach its peak. Record the number below the data table.

Name of soft drink: _____

Data Table		
Heartbeats counted in 15 seconds	**Multiply by 4**	**Heart rate per minute**
Resting:	x 4	
1	x 4	
2	x 4	
3	x 4	
4	x 4	
5	x 4	
6	x 4	
7	x 4	
8	x 4	
9	x 4	
10	x 4	

Difference between resting heart rate and highest heart rate after caffeine: _____

Number of minutes after finishing the drink for the heart rate to reach its peak: _____

11. How accurate was your prediction? Did your heart rate go up, down, or stay the same after you drank a caffeinated soft drink?

Extension Question

Could sugar have been the ingredient in soda that affected your heart rate, rather than caffeine? How could you find out?