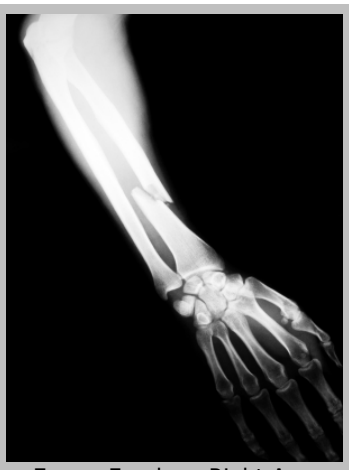
A Case of Osteoporosis

The Case:

Emma broke her arm when she fell during track practice. This was the third time that Emma had a bone fracture (break) so her doctor suggested that she get a bone density test.

Emma was shocked to hear that the bone density test showed that her bone density is lower than normal for a teenage girl. Emma's doctor warned her that she is at increased risk for developing osteoporosis when she gets older.



Emma Frank - Right Arm

Part 1: Modeling Osteoporosis

Make a model to help Emma understand how the bones of someone with osteoporosis are different from normal bones.

1. Observe the model of Normal Bone and read **Information Card 1.** Do not open the Normal Bone model.

2. Read the description of bones in someone who has osteoporosis on **Information Card 2.**

3. Use the materials in the bag to make a model of **Osteoporosis Bone.** The osteoporosis bone model should look different from the normal bone model. *Hint: Not all pieces need to be used. Use just enough to fill the tube.*

   Materials provided:
   - 10 white disks
   - 10 star beads
   - 1 Osteoporosis Bone tube with lid

4. Draw or describe your model in the space below.

5. Compared to the normal bone, does the osteoporosis bone model you made have more or less calcium? Explain how Emma could tell from looking at your model and Information Card 1.

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6. Compared to the normal bone, is the osteoporosis bone model you made more or less porous? Explain how Emma could tell from looking at your model and Information Card 1.

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7. Explain how you could test your Osteoporosis Bone model to determine whether it was more dense or less dense than the Normal Bone model. *Hint: Use the information on Card 1.*

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Part 2: Evaluating Claims about Osteoporosis

The **Osteoporosis Claims** chart below lists some claims that Emma heard about osteoporosis. Emma was **skeptical** about some of the claims. She wanted to know if there was evidence to support these claims.

Skeptical: Having or expressing doubt about a claim or a statement.

1. Use the **Information Cards (1-8)** and the **Understanding Osteoporosis** poster to evaluate the claims about osteoporosis.
   - For the Information Card column, write the number of at least one Information Card that provides evidence to support or refute (not support) the claim. You may use cards more than once.
   - For the Poster column, write the letter of at least one section of the poster that provides evidence to support or refute (not support) the claim. You may use a section more than once.
   - For the Conclusion column, indicate whether the evidence supports the claim, refutes the claim, or is inconclusive.

Osteoporosis Claims	Sources of Evidence		Conclusion (Supports, Refutes or Inconclusive)
	Information Card (card number)	Poster (section letter)	
A. Osteoporosis occurs when the body loses too much bone tissue, makes too little bone tissue, or both.			
B. Males do not need to worry about bone fractures caused by osteoporosis.			
C. The best time to reduce the risks of osteoporosis comes during the teenage years.		**No evidence on poster**	
D. As bone density increases, bones become weaker and more likely to fracture.			
E. According to calcium supplement labels, the FDA has evaluated the use of calcium supplements as a way to prevent osteoporosis.		**No evidence on poster**	
F. Having a family member with osteoporosis increases the risk of osteoporosis.			
G. Changes to lifestyle and diet can reduce a person's risk of developing osteoporosis later in life.			
H. Taking calcium supplements reduces the risk for bone fractures due to osteoporosis.			

2. Should Emma and other teens take calcium supplements to prevent osteoporosis and bone fractures when they get older? Support your answer with specific evidence from the Information Cards, poster, and bone models.

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3. If Emma does <u>not</u> want to take calcium supplements, what are <u>two</u> actions she could take to improve her bone health? Support your answer with specific evidence from the Information Cards, poster, and bone models.

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4. Emma is concerned that the Understanding Osteoporosis poster is out-of-date. How should the poster be revised to include the evidence on Information Card 7?

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5. Do you think that you might be at risk for osteoporosis? Explain why or why not?

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