

contents and sample pages

Title	The Case of the Mystery Bone
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ISBN/ISSN	978-0-958662-05-5
Published by	MANSW Inc.

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A. Using mathematics in detective work

Bone Puzzle Baffles Detectives

Jacinta Garcia

Detectives have found a bone buried in a hole on the banks of Lake Kegonsa in Stoughton. Forensic anthropologists have established that the bone is a radius bone, and that it certainly belongs to a human being. The bone measured 28 cm long.

Police don't know the gender of the person yet. The detectives hope soon



to provide a clearer picture of what this person may have looked like. Investigations are continuing.

Imagine that you are a forensic scientist and that you open your morning paper to find the following story.

1. Discuss with a partner which part of the body the radius might be. If no one seems to know which bone it is, check in a science textbook or the dictionary. Draw a quick sketch in your workbook to show which bone it is.
2. Take the measurements in centimetres of the radius bone and height for at least five people in your class.
3. Do you see any sort of pattern or relationship between a person's height and the length of his or her radius bone?
4. Use any patterns you found to make a first prediction about the height of the mystery person whose bone was found.

Solutions and Samples of Student Work

Hints and Comments

5. This will provide a good source of discussion, and a combined list could be written on the board at some stage. Possible answers include:
- Not taking care that one end of the tape is exactly on zero.
 - They might be wearing shoes one time, and not the next.
 - Not having the tape taut.
 - One person 'flattens' the subject's hair before measuring.
 - Measuring to different levels of precision (e.g., cm v. mm).
6. and 7. These questions invite two approaches:
- to measure a range of tibias and make another prediction;
 - to measure the tibias of girls only, and consider what they predict about a person's height.
- (Either approach is fine.)

Once again, the form and sophistication of conclusions will vary, and that is fine too. The discussion will give each group the chance to share their findings, and learn from each other.

One group of students concluded that the height was $2 \times \text{radius} + 2 \times \text{tibia}$! (In fact, forensic anthropologists use rules just like this:

$1.35 \times \text{humerus} + 1.95 \times \text{tibia} + 52.77$ for height).