



# TEACHER'S NOTES **CSI: BONES**

## OVERVIEW

Aimed at **key stage 2** (9-11 years)

(Prep time 5 mins/class time 35 mins)

Learners play the role of forensic investigators, considering what they can learn from a single footprint left at a crime scene. Working in small groups they collect data from their classmates to draw some general conclusions about the relationship between foot length and height, before applying these to the evidence. Volunteers then take part in a mock courtroom scenario, acting as expert witnesses and presenting their findings.

## CURRICULUM LINKS

- 🔔 Scientific and technological understanding: make and record accurate measurements and detailed observations, presenting them appropriately, and analyse, interpret and apply them
- 🔔 Understanding English, communication and languages: organise and adjust what they say, including the use of spoken standard English, according to the formality of the context, the needs of the listeners and any communication technology being used

## LEARNING OBJECTIVES

- 🔔 To take and record accurate measurements of physical attributes
- 🔔 To work effectively in small teams
- 🔔 To collect and interpret results to answer a specific question
- 🔔 To communicate clearly about methods and results

## you will NEED

- 🔔 **The intruder** image (provided)
- 🔔 **CSI: Bones** worksheet (provided), one for each group of four or five learners
- 🔔 Tape measures and calculators, one of each per group of four or five learners

## PREPARATION

- 🔔 Print off enough copies of the **CSI: Bones** worksheet for each group of learners
- 🔔 Cut out The intruder footprint image and place it on the floor of the classroom

## Activity

- 🔔 Start the activity by introducing a fictional scenario: someone has broken into the classroom and stolen some IT equipment. They have left a footprint behind – but nothing else. Explain that you want the class to investigate to see what they can find out about the intruder.
- 🔔 Ask the class to think about what they might be able to learn from the footprint and how it could tell us something about the intruder. Prompt with questions such as;  
**What could we do with this evidence?**  
**If we know something about someone's foot, can we say anything about the rest of their body?**

# TEACHER'S NOTES

## CSI: BONES

### Activity

continued

Try to draw out the idea that you could measure the foot, and that the size of the foot might be linked to the size of the intruder's overall body.

Ask the class how you could check whether there is a link between foot length and height. Draw out the idea that you could measure the foot length and height of other people.

Split the class into groups of four or five learners and give each group a **CSI: Bones** worksheet, a tape measure and a calculator. Ask the groups to collect the information shown and calculate the average ratio between height and foot length for their group. This should be approximately 15, but will vary from one group to another. Armed with this information they should now measure the length of the footprint to calculate the intruder's height.

Finally, ask learners to work in groups to prepare answers to the questions shown. Set up a courtroom scenario in the classroom and ask for volunteers to give evidence to the judge and jury (you and the rest of the class). The CSI expert must stand up and answer formal questions, such as;

**What is your name?**

**In your expert opinion, how tall was the intruder?**

**How did you come to that conclusion?**

**Could there be any other answer?**

The jury then vote on whether the evidence should be taken into account by the court.

### EXTENSION

Investigate whether the length of someone's foot is related to the size of other parts of their body. Learners work in small groups, using the same techniques to measure their leg, arm, waist and head and identify if there is a clear ratio between any of these factors and foot length. They then calculate each of these measurements for the intruder, stating how confident they are about whether these are correct. The waist measurement is likely to be the number they are least confident about (because you might be tall and skinny, or short and chunky).

### FURTHER information

You could try out some of these fun forensic activities in the classroom:  
[http://www.planet-science.com/whodunit/go/InfoPage\\_32.html](http://www.planet-science.com/whodunit/go/InfoPage_32.html)

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# THE INTRUDER



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# CSI: BONES

Is there a link between the length of someone's foot and their height? Let's collect some data to see...

## COLLECTING DATA

- For each member of the team:
- Take off your shoes
- Measure your height in centimetres and the length of your foot (from your heel to the end of your big toe)
- Note your results in the table
- Calculate the ratio between your height and your foot length (by dividing your height by your foot length) and write it down



| Name | Height (cm) | Length of foot (heel to big toe) (cm) | Ratio = Height/foot length |
|------|-------------|---------------------------------------|----------------------------|
|      |             |                                       |                            |
|      |             |                                       |                            |
|      |             |                                       |                            |
|      |             |                                       |                            |
|      |             |                                       |                            |

Calculate the average value of the ratio by adding together all the values of the ratio and dividing by the number of people in your group:

|                         |                           |  |
|-------------------------|---------------------------|--|
| Total of all the ratios | Number of people in group | Average ratio = total/number of people |
|                         |                           |  |

Work backwards to find out the height of the intruder. (Hint, their height will be equal to the Average ratio multiplied by the length of their foot)

Write your answer here: I think the intruder is \_\_\_\_\_ cm tall.

## PRESENTING DATA

- As a CSI expert, you may be asked to present this evidence in court, how would you reply to these questions:
- How tall do you think the intruder is?
- How did you work out this answer?
- Could there be any doubt that the intruder is this height?



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