This exercise used a news story from the popular press to illustrate principles of using DNA fingerprints as forensic evidence. It has worked successfully with Junior High School students, may be suitable for other ages as well. Simple measuring and arithmetic are involved.
DNA ladder – laminate and cut out one ladder per student
'DNA ladder' is used to identify ('score') DNA fingerprint bands
1) Using the DNA ladder - for each child's DNA fingerprint, write the letter of each band next to it ('score' the fingerprint).

2) How many bands does child 1 carry? ______
   How many bands does child 2 carry? ______

3) For child 1 and 2, draw a square around each band inherited from the father. Next, draw a circle around each band from the mother.

4) How many bands in child 1 came from the father?______
   Fraction DNA shared by child 1 and father =
   \((\text{# of child 1's bands from father}) \div (\text{# bands child 1 carries})\)
   
   \[ = \frac{\text{# of child 1's bands from father}}{\text{# bands child 1 carries}} = 0.______ = _____\%

   How many bands in child 1 came from the mother?______
   Fraction DNA shared by child 1 and mother =
   \((\text{# of child 1's bands from mother}) \div (\text{# bands child 1 carries})\)
   
   \[ = \frac{\text{# of child 1's bands from mother}}{\text{# bands child 1 carries}} = 0.______ = _____\%

5) Answer the questions in #4 for child 2.

6) Draw lines connecting bands that are shared between the siblings. How many bands are shared between siblings?______
   Fraction DNA shared by siblings =
   \((\text{# of shared bands}) \div (\text{# bands per child})\)
   
   \[ = \frac{\text{# of shared bands}}{\text{# of bands per child}} = 0.______ = _____\%
Within a few hours of BL's demise, the news reported that he had been identified with 99.9% accuracy based on a DNA fingerprint of a ½ sister that died in a hospital in Boston*. According to the Los Angeles Times, BL had no full-siblings and more than fifty ½-siblings.

1) Using the DNA ladder, score BL's fingerprint.

2) Full siblings share 50% of their bands, while ½ siblings share 25%. How many of BL's eight bands did he share with his ½ sister? _________

3) Draw a few possible DNA fingerprints of BL's ½-siblings. What is the minimum number of ½-siblings needed to reconstruct BL's complete DNA fingerprint?

1) Detectives didn’t have access to BL’s parents’ DNA samples, but he reportedly had several wives and children. If you wanted more evidence to confirm his identity, would you DNA fingerprint the wives, the children, or both?

2) For each child, circle the bands they inherited from their mother. Draw a square around each band from BL.

3) Using the DNA ladder, draw BL’s predicted DNA fingerprint. If each person normally carries eight bands, how many bands are missing? ______
   How might the detectives discover the missing bands?