

YOUR NAME:

## Pre-arrival Task

*Your first tutorial will be held during Intro Week, either on Monday 19 at 2.30 pm or Thursday 22 September at 3.00 pm (you will be informed which on the afternoon of Monday 19, at the departmental advice session starting at 1.30 pm in Chemistry Lecture Theatre 1). Part of this tutorial will involve discussion of the following task and you are therefore asked to prepare to discuss your answers at this meeting. This work will **not** contribute to your degree marks, but is formative (i.e. helps to develop or 'form' your learning).*

### Background

A scientist hypothesised that spiders hear through organs located on their legs. The scientist performed the following experiment to test the hypothesis:

- A spider was placed on a metal tray, situated on a wooden bench
- A 200g weight was dropped from 300 mm onto the table 200 mm from the spider, in order to make a standardised and reproducible loud noise (the idea being that if the spider heard the noise it would react by jumping)
- The spider was observed carefully for any reaction
- It was noted that the spider 'jumped' on the first drop of the weight and also on the next 19 occasions that the weight was dropped
- From this baseline experiment the scientist concluded that the spider can hear the noise and it responded by jumping.
- Furthermore the scientist hypothesised that the hearing organs might be located on the spider's legs

To test the scientist's hypothesis permission was obtained from the appropriate authority to perform an operation to surgically remove the spider's legs. The scientist's hypothesis being that if the organs of hearing are located on the spider's legs, amputation would effectively render the spider unable to hear. Sure enough when the experiment was repeated the spider no longer jumped in response to the loud noise and the scientist took this as confirmation that spiders hear through organs located on their legs.

**Your Name:**

*Write your answers to the following questions in the spaces provided. Your answers will be collected during the first tutorial.*

**Questions:**

1. Give TWO criticisms of the experimental design  
a.b.
  
2. Why did the scientist repeat the experiment?
  
3. How would **you** have designed an experiment to determine if spiders have organs of hearing on their legs? Be prepared to expand on this in the tutorial.
  
4. Is it valid to use spiders or other species (eg flies, fish or mice) as models of human biomedicine? Be prepared to explain your answer
  
5. Name ONE discovery that you know of that was made using animal models of human disease

Thank you.

*Please remember to write your name on both sheets and hand in your answers during your first tutorial.*