# SKILLS IN SCIENCE

The microscope

Eyepiece Lens: lens at the top that you look through—usually 10X power. **Tube (or barrel):** connects eyepiece to the objective lenses. **Arm:** supports the tube and connects it to the base. **Base:** bottom of the microscope. **Lamp:** steady light source. If your microscope has a mirror, it is used to reflect light up through the bottom of the stage. **Stage:** flat platform where you place your slides. Clips hold the slides in place. **Revolving Nosepiece:** part that holds the objective lenses and can be rotated to change the power. **Objective Lenses:** there are 3 objective lenses on most microscopes consisting of 4X, 10X, and 40X powers. When coupled with a 10X eyepiece lens, we get total magnifications of 40X (4X times 10X),
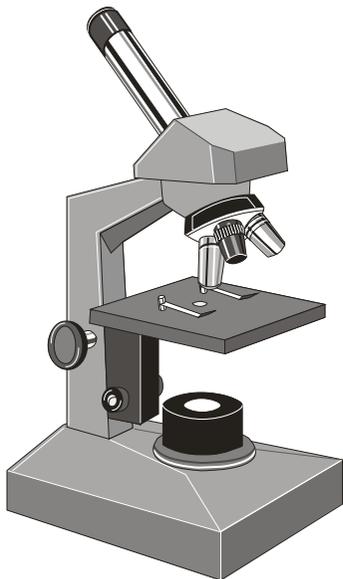
How to Focus Your Microscope: Start with the lowest power objective lens first and while looking from the side, move the lens as close to the specimen on the stage as possible without touching it. Now, look through the eyepiece lens and **focus AWAY only** until the image is sharp. Once the image is sharp with the low power lens, click in the next power lens and do minor adjustments with the focus knob. Turning the fine focus knob a bit should be all that's necessary.

Making a wet mount slide.
Place slide on a flat surface with the specimen on the slide. Place a drop of water on the specimen.
Hold the cover-slip by its sides and lay its bottom edge on the slide close to the specimen at a 45° angle.
Slowly lower the cover-slip so that it spreads the water
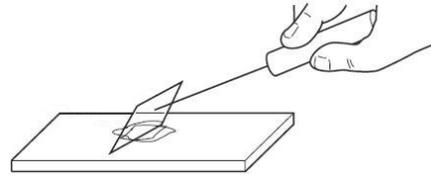
CLASSIFICATION KEYS

A dichotomous key (branching key or go to key) is a method for determining the identity of something by going through a series of choices. Dichotomous means "divided in two parts". At each step of using the key, the user is given two choices; each alternative leads to another question until the item is identified.

1a bean is round - chick pea
1b bean is not round—go to 2
2a bean has dark colour—go to 3
2b bean has light colour—go to 4
3a bean colour is solid—kidney bean
3b bean colour is speckled—pinto bean
4a bean—bean is white—navy bean
4b bean has a spot— black eyed pea

*Here are two forms of dichotomous keys, one for identifying types of "beans" and the other for "bugs"*
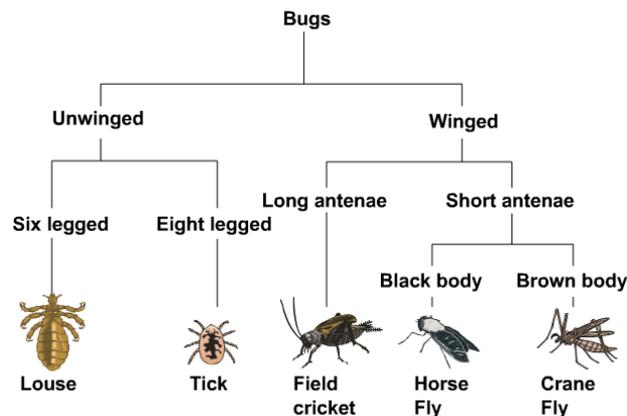
WANGANUI HIGH SCHOOL

FAIR TESTING

It is important for some of our experiments to be **fair test experiments**. You conduct a fair test by making sure that you change one thing (variable) at a time while keeping all the other conditions the same.
Imagine that we want to measure which is the fastest toy car to roll down a sloping ramp. If we gently release the first car, but give the second car a push start, is this a fair test of which car was fastest? No! The only thing that should change between the two tests is the toy car; we should start them down the ramp in exactly the same way.
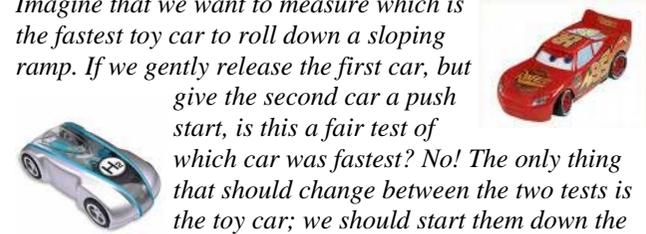
Here is a fair test experiment.
We wanted to find out how long it took parachutes made of different materials ❶ *to fall to the ground. We made them the same size* ❷ *& dropped them from the same height* ❷*. We then timed how long* ❸ *each took to fall.*

To make an experiment reliable it is best to repeat the experiment a number of times and average the results. Reliability is NOT the same as accuracy. Accuracy is how exactly you can measure something or time something.

Calculating averages: To calculate the average, add up all the values measured, count how many values were used, and divide by this number. Eg the average of $5 + 6 + 3 + 6$
- Add up the values: $5 + 6 + 3 + 6 = 20$
- There were 4 values
- 20 divided by 4 = 5

Glossary

Investigation Practical activity.
Prediction/Hypothesis What we think will happen.
Independent Variable Thing we change during the investigation ❶.
Dependent Variable Thing which is affected by the independent variable ❸.
Controlled Variables Things that are kept the same throughout the investigation ❷.
Result What did happen.
Conclusion Our explanation of this effect.