

## Guidance for Topic 7 – Practical 1

### *Extracting DNA from peas*

#### **Safety**

Although great care has been taken in checking the accuracy of the information provided in this guidance, Cambridge University Press shall not be responsible for any errors, omissions or inaccuracies.

Teachers and technicians should always follow their school and departmental safety policies. You must ensure that you consult your employer's model risk assessments and modify them as appropriate to meet local circumstances before starting any practical work. Risk assessments will depend on your own skills and experience, the skills and experience of your students, and the facilities available to you. Everyone has a responsibility for his or her own safety and for the safety of others. The notes below should not be regarded as a risk assessment.

You should carry out the practical yourself before presenting it to students. Make sure you are comfortable with the procedures, and can anticipate any difficulties any of your students may encounter.

#### **Guidance**

This practical enables students to experience the extraction of DNA from readily available sources. Although it does not produce a pure specimen of DNA it nevertheless demonstrates the stages that are used in the process.

#### **Apparatus and materials**

Each group will need:

- kitchen blender
- peas (or kiwi fruit)
- 3 g sodium chloride, NaCl
- detergent (washing-up liquid)
- distilled water
- measuring cylinders (10 cm<sup>3</sup> and 100 cm<sup>3</sup>)
- beaker (100 cm<sup>3</sup>)
- spatula
- 1% protease solution
- a centrifuge, tube and bung, if available
- test tube and bung, if centrifuge not available
- ice cold ethanol
- glass rod

Note that pineapple juice or a spatula of meat tenderiser may be used in place of the protease solution.

#### **Setting up the practical**

The practical works best if the ethanol is very cold so this should be stored in a fridge or over ice until it is needed.

Extra time must be allowed if a centrifuge is not available so that the suspension fully settles before the ethanol is added.

#### **Answers to questions**

- 1 The material will contain a mixture of DNA and some RNA, although much of the RNA will be digested by RNAase as the cells are broken up.
- 2 In DNA profiling, fragments are cut from DNA for electrophoresis. The material extracted here is a whole genome so would not produce clear bands if used for electrophoresis.