**RISK ASSESSMENT SCHOOL:**

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| **experiment 1.1: Extracting DNA** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 2–3 and 180

**Equipment required**

|  |
| --- |
| Class requires:  PART A:  100g (1/2 cup) dried peas soaked overnight in 2 cups of water, or frozen peas (thaw first)  200ml (1 cup of water)  6g (1 tsp) table salt  20ml of dishwashing liquid  1g (1/4 tsp) meat tenderiser  Blender  Sieve  Stirring rod or spoon  Timer  PART B:  Each group requires:  Ice-cold ethanol (stand a sealed bottle containing 200ml of ethanol in a metal bowl of ice water for an hour prior to using)  Methylene blue stain  Test tubes and test tube rack or 50ml glass vials  Skewer, glass rod (toothpick for vials)  Microscope  Clean microscope slides and cover slips |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- | --- |
| **Salt (solid)** | **WARNING**  C:\Users\temp\Dropbox\GHSHar[1].gif  Irritant | | H315 – Causes skin irritation  H319 – Causes serious eye irritation.  H350 – May cause respiratory irritation | Wear gloves.  IF ON SKIN: wash hands with soap and water.  Wear safety glasses.  IF IN EYES: flush immediately with fresh running water for several minutes. If irritation continues seek medical advice.  Avoid breathing dust. Use in a well ventilated area. |
| **Ethanol** | **DANGER**  https://jr.chemwatch.net/Resources/Images/GHSFla.GIF  Flammable  **C:\Users\temp\Dropbox\Healthhazard_big[1].jpg**  Health hazard | | H225 – Highly flammable liquid and vapour | Wear safety equipment. Decant in fume cupboard to minimise vapours.  **DO NOT USE NEAR IGNITION SOURCES.**  IF IN EYES: rinse with water for several minutes. Lift eyelids and gently flush with clean running water. If irritation persists seek medical advice.  IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower  IF INHALED: remove person to fresh air keep at rest in a position comfortable for breathing.  IF SWALLOWED: Do not induce vomiting. Seek medical advice. |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
| **Methylene blue stain working solution**  (liquid) |  | Not classified as hazardous. | Wear safety glasses, lab coat, gloves and closed in shoes when handling. Use in a well ventilated room.  IF SWALLOWED: Immediately give a glass of water.  IF ON SKIN: Wash skin with water and soap. Seek medical help if irritation persists.  IF IN EYES: If in eyes rinse with clean running water for several minutes. If irritation continues seek medical advice.  IF INHALED: Remove patient to fresh air if uncomfortable. |
| **Meat tenderizer** |  |  | Check use by date |
| **Dried or frozen peas** |  |  |  |

Other hazards and possible risks

|  |
| --- |
| BLENDER - Keep fingers and hair clear of rotating blades. The lid should be securely on before it will start. Ensure electrical equipment has current tag, safe and operated correctly.  Wooden splint/taper or toothpick may have splinters that can embed in skin.  Test tubes, vials, glass stirring rods, microscope slides and coverslips may break and cause cuts. Sweep up broken glass with a brush and dustpan, do not use fingers. Discard any chipped or cracked glassware to a broken glass bucket.  **Microscopes** are delicate instruments and should be handled carefully and correctly. They are usually connected to mains electricity and therefore there is the risk of electric shock, particular precaution around liquids, keep away. Ensure electrical equipment has current tag, safe and operated correctly. Check cords regularly and replace if any signs of damage. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes | Yes | Yes |  | Use a fume cupboard or a well ventilated room when dispensing ethanol. |
|  | | | | |

Student clean up and disposal of wastes

|  |
| --- |
| Pea pulp can be wrapped or put in a bag then put in the bin.  Left over DNA source and the student ethanol/DNA mixture can be put in a labelled waste beaker for the lab technician to dispose of.  Soak the blender. Perhaps leave for the lab technician to clean as the blades are very sharp.  Remove cover slips from the slides and discard to the glass bin. Cover slips can cause cuts when the lab technician is trying to clean them. Put slides in a container with water to soak.  Gather all equipment to one place for the lab technician.  Wipe all benches and dry. Check sinks are clear. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

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| **Teacher’s name** | **Teacher’s signature** | **Date** |
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**RISK ASSESSMENT SCHOOL:**

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| **CHALLENGE 1.2: Modelling the structure of DNA** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 4–5 and 181

**Equipment required**

|  |
| --- |
| Each group requires:  4 long pipe cleaners and 24 beads (6 different colours) |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- |
|  |  |  |  |

NON-HAZARDOUS substances

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| --- | --- | --- | --- |
|  |  |  |  |

Other hazards and possible risks

|  |
| --- |
| Pipe cleaners usually have a wire running up the middle. This wire can be sharp and may prick skin.  Beads are to be used for the purpose they are asked for. Don’t allow them to be thrown, swallowed or left on the floor. Left on the floor they could be a slip hazard. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
|  |  |  |  |  |

Student clean up and disposal of wastes

|  |
| --- |
| Collect all equipment to one place for the lab technician  Separate the beads from the pipe cleaners. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

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**RISK ASSESSMENT SCHOOL:**

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| **Skills lab 1.4: Cell division in action** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 10–11 and 183

**Equipment required**

|  |
| --- |
| Each group requires:  Prepared microscope slide/s showing a tissue that is in the process of growth and development.  Microscope |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- |
|  |  |  |  | |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
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Other hazards and possible risks

|  |
| --- |
| Prepared microscope slides may break and cause cuts. Sweep up broken glass with a brush and dustpan, do not use fingers. Discard any chipped or cracked slides to a broken glass bucket.  Microscopes are delicate instruments and should be handled carefully and correctly. They are usually connected to mains electricity and therefore there is the risk of electric shock, particular precaution around liquids, keep away. Ensure electrical equipment has current tag, safe and operated correctly. Check cords regularly and replace if any signs of damage. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes |  |  |  |  |
|  | | | | |

Student clean up and disposal of wastes

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| --- |
| Collect all slides and store carefully into its protective box.  Unplug microscopes, cover and carefully put away. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

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**RISK ASSESSMENT SCHOOL:**

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| **CHALLENGE 1.5: Modelling meiosis** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 12–13 and 183

**Equipment required**

|  |
| --- |
| Each group requires:  Pipe cleaners, sticky tape, felt-tip pens, A4 sheet of paper |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- |
|  |  |  |  | |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

Other hazards and possible risks

|  |
| --- |
| Pipe cleaners usually have a wire running up the middle. This wire can be sharp and may prick skin.  Be aware of any safety instructions for the felt tip pens you intend using. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes |  |  |  |  |
|  | | | | |

Student clean up and disposal of wastes

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| --- |
| Reuse pipe cleaners.  Collect all equipment to one place for the lab technician. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

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**RISK ASSESSMENT SCHOOL:**

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| **experiment 1.6: Zazzle genetics** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 14–15 and 184

**Equipment required**

|  |
| --- |
| Each group requires:  A bag containing different coloured counters  Permanent marker  Toothpicks  Pipe cleaners  Pink and white large marshmallows  Small marshmallows  Blue and black felt-tipped pens |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- |
|  |  |  |  | |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
| **Marshmallows** |  | Not classified as hazardous | Do not eat in the laboratory |

Other hazards and possible risks

|  |
| --- |
| Pipe cleaners usually have a wire running up the middle. This wire can be sharp and may prick skin.  Toothpicks may have splinters that can embed in skin.  Permanent marker may contain solvents, avoid breathing vapour. Replace lid after using. Difficult to remove off clothing and benches. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes |  |  |  |  |
|  | | | | |

Student clean up and disposal of wastes

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| --- |
| Marshmallows, used toothpicks and pipe cleaners can go in the bin.  Collect all other equipment to one place for the lab technician. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

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I have read this risk assessment and I understand the safety procedures and risks involved.

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**RISK ASSESSMENT SCHOOL:**

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| **experiment 1.7: blood typing experiment** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 16–17 and 185

**Equipment required**

|  |
| --- |
| Each group requires:  Anti- A solution (2M hydrochloric acid)  Anti-B solution (2M sulfuric acid)  Sample blood O (distilled/deionised water)  Sample blood A (0.1M silver nitrate solution)  Sample blood B (0.1M barium nitrate solution)  Sample blood AB (a 50:50 mix of 0.1M silver nitrate and 0.1M Barium nitrate solutions)  Spotting tiles  6 pipettes, one for each solution |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- | --- |
| **2M Hydrochloric acid (solution)** | **WARNING**  https://jr.chemwatch.net/Resources/Images/GHSHar.GIF  https://jr.chemwatch.net/Resources/Images/GHSCor.GIF  Corrosive | | H290 - May be corrosive to metals  H330 - Fatal if inhaled  H314 - Causes severe skin burns and eye damage  H335 - May cause respiratory irritation | Wear safety glasses, lab coat, gloves and closed in shoes when handling.  **Diluted acid** may cause burns and eye damage. Avoid inhalation of vapours. Use in a well ventilated room.  IF ON SKIN: Rinse skin with water/shower  IF IN EYES: Rinse eyes carefully with water for several minutes. Remove contact lenses if able to without causing distress. Continue rinsing. Seek medical advice.  IF INHALED: remove person to fresh air keep at rest in a position comfortable for breathing.  If SWALLOWED: Rinse mouth. Do not induce vomiting.  Seek medical attention if required. |
| **2M Sulfuric acid (solution)** | | **DANGER**  https://jr.chemwatch.net/Resources/Images/GHSCor.GIF  Corrosive | H290 - May be corrosive to metals  H290 – May be corrosive to metals  H314 - Causes severe skin burns and eye damage  H319 – Causes serious eye irritation | Wear safety glasses, lab coat, gloves and closed in shoes when handling.  **Diluted acid** may cause burns and eye damage. Avoid inhalation of vapours. Use in a well ventilated room.  IF ON SKIN: Rinse skin with water/shower  IF IN EYES: Rinse eyes carefully with water for several minutes. Remove contact lenses if able to without causing distress. Continue rinsing.  IF INHALED: remove person to fresh air keep at rest in a position comfortable for breathing.  If SWALLOWED: Rinse mouth. Do not induce vomiting.  Seek medical attention if required. |

NON-HAZARDOUS substances

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| --- | --- | --- |
| **0.1M Silver**  **nitrate (solution)** | Not classified as Hazardous | Wear safety glasses, lab coat, gloves and closed in shoes when handling.  IF IN EYES: rinse immediately with plenty of fresh running water.  IF ON SKIN: Wash off skin with running water and soap. |
| **0.1M Barium nitrate**  **(solution)** | Not classified as Hazardous | Wear safety glasses, lab coat, gloves and closed in shoes when handling.  IF IN EYES: rinse immediately with plenty of fresh running water.  IF ON SKIN: Wash off skin with running water and soap.  IF SWALLOWED: Seek medical attention without delay. |

Other hazards and possible risks

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| --- |
| Any glassware or ceramic spotting tiles used can break with the potential for cuts. Sweep up broken glass or ceramic spotting tiles with a brush and dustpan, do not use fingers. Rinse any chemical residue off and discard to a broken glass bucket. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes | Yes | Yes |  |  |
|  | | | | |

Student clean up and disposal of wastes

|  |
| --- |
| The students use two drops of each diluted chemical in this experiment. As such small amounts they may be washed down the sink, followed by water.  Rinse spotting tiles under water, collect and place all equipment in one place for the lab technician. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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I have read this risk assessment and I understand the safety procedures and risks involved.

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**RISK ASSESSMENT SCHOOL:**

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| **experiment 1.8: Colour-blindness inheritance** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 18–21 and 186

**Equipment required**

|  |
| --- |
| Each group requires:  2 counters  Permanent marker |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- |
|  |  |  |  | |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

Other hazards and possible risks

|  |
| --- |
| Permanent markers may contain solvents, avoid breathing vapour. Replace lid after using. Difficult to remove off clothing and benches.  Counters could be a choking hazard or be thrown. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes |  |  |  |  |
|  | | | | |

Student clean up and disposal of wastes

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| --- |
| Collect all equipment to one place for the lab technician. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

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| **Teacher’s name** | **Teacher’s signature** | **Date** |
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**RISK ASSESSMENT SCHOOL:**

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| **Challenge 1.13: Edible genetic engineering** |

*Risks should be managed by use of PPE and/or specified control measures.*

Description of procedure (attach a copy of the experiment)

**Oxford Science 10:** pages 34–35 and 188

**Equipment required**

|  |
| --- |
| Each group requires:  1 bag of lolly snakes  1 bag of sour worm lollies |

**Hazardous chemicals required/produced**

| **Reactant or product name and concentration** | **GHS classification** | **GHS hazard statement** | **Control measures** |
| --- | --- | --- | --- |
|  |  |  |  | |

NON-HAZARDOUS substances

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

Other hazards and possible risks

|  |
| --- |
| Do not eat food in the science laboratory. |

Protective measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab coat | Safety glasses | Gloves | Fume cupboard | Other |
| Yes |  |  |  |  |
|  | | | | |

Student clean up and disposal of wastes

|  |
| --- |
| Lollies to be saved for future classes or discarded to the bin. They are not to be eaten if they have been handled. |

Assessor’s signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*\*\*\*\***This assessment is not valid until it has been completed and signed by an assessor approved by the school.**

***All teachers are to sign the following statement before conducting this experiment.***

I have read this risk assessment and I understand the safety procedures and risks involved.

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| **Teacher’s name** | **Teacher’s signature** | **Date** |
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| \*\*\*\*NOTES:   * Individual schools have a legal obligation to acquire their own manufacturer’s SDS and produce a risk assessment relevant to their own situation. * This risk assessment sheet is provided for your guidance only. * Disposal of waste is subject to the laws and regulations of states, territories and local authorities. * It is not to be assumed that products bought from supermarkets are non-hazardous.   DISCLAIMER:  These guidelines are designed to serve as a general reference only. It does not replace the school’s legal obligation to provide a valid risk assessment to ensure the safety of the staff and students conducting this experiment. While the Publisher has endeavoured to ensure that the material provided is free from error, the Publisher does not warrant the accuracy, adequacy or completeness of that material or that the material is suitable for your intended use. To the fullest extent permitted by law the Publisher disclaims all responsibility for any actions taken or not taken in relation to the material provided. |