**Year Group: 3** **Subject: DT** **Unit 3C:** **Moving Monsters Term: Spring 2008**

|  |  |
| --- | --- |
| Prior Learning  It is helpful if the children have:   * learnt how materials can be joined to allow movement * generated and communicated ideas in a variety of ways * joined and combined materials using simple hand tools * evaluated their work as it progresses and at the end   This unit builds on Units 1A ‘Moving pictures’, 2C ‘Winding up’ and 3A ‘Packaging’.  It also builds on Science Units 1E ‘Pushes and pulls’, 2D ‘Grouping and changing materials’ and 2E ‘Forces and movement’. | Vocabulary for the Unit  In this unit, children will use words and phrases relating to:   * designing *eg brainstorm, suggestion, evaluate, ideas, constraints, appropriate, graph, data, sort, order, set, label, title, list, probable, possible, impossible* * making *eg planning, storyboard, components, fixing, tubing, syringe, attaching, finishing*   knowledge and understanding *eg control, pneumatic system, pressure, inflate, deflate, input, output, pump, hinge, fastest, slowest, often, always, sometimes, never* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Objectives** | **Activities** | **Assessment** | **Resources** |
| 1 | **Investigative, disassembly and evaluative activities (Ideas) (1)**   * how air pressure can be used to produce and control movement * techniques for making simple pneumatic systems * to use appropriate vocabulary to describe how things work | Show the children familiar objects that use air to make them work *eg recorder, whistle, bicycle pump, balloon, inflatable swimming aids, foot pump for inflating an air bed, coiled party blowers. What does the air do? How has it been used in the design of these products?*  Construct a simple pneumatic system by joining a balloon to 5mm tubing and then to a washing-up liquid bottle. Encourage the children to investigate:  *What happens to the air when you squeeze the bottle?*  *What happens when you let go?*  *What happens if you put fabric over the balloon and then squeeze the bottle?*  *Can you lift a book with the balloon?*  Make a class collection of images of monsters for the children to refer to – real, fictional, scary or friendly, human, animal or alien. | Are the children able to:   * explain how simple pneumatic systems work using appropriate vocabulary * are familiar with techniques for making simple pneumatic systems * demonstrate good speaking and listening skills * discuss their investigations using the vocabulary of the unit | recorder, whistle, bicycle pump, balloon, inflatable swimming aids, foot pump for inflating an air bed, coiled party blowers. washing-up liquid bottle, fabric, book |
| 2 | **Investigative, disassembly and evaluative activities (Ideas) (2)**   * to compare the effectiveness of different systems * to use appropriate vocabulary to describe how things work | Construct an alternative pneumatic system by joining two syringes with a piece of plastic tubing. Ask questions to help children investigate *eg What happens when the plunger of one syringe is pressed in?* Compare the two systems and discuss their similarities and differences. (Note: take care as the plunger may come out with force!)  Collect toy or model animals and creatures. Discuss how they have been made, in particular, how the colouring, markings and texture of the body parts have been replicated. | Are the children able to:   * explain how an alternative pneumatic system work using appropriate vocabulary * compare the two systems and discuss similarities and differences * discuss how products have been made, and how models replicate real-life features | Pictures of dinosaurs, syringes, plastic tubing, balloon, toy or model dinosaurs, dragons etc (Crocodiles) |
| 3 | **Exploring and developing ideas (3)**   * how to assemble simple pneumatic systems * ways of fixing components * ways of using pneumatic systems in conjunction with simple levers to control movement * design team monster | Demonstrate techniques for assembling the two pneumatic systems used in the IDEAs.  Show children how balloons or syringes can be used in conjunction with simple levers to control movement *eg*  *place the balloon in a small box with a lid so that when inflated it raises the lid*  *use a card hinge to attach one of the syringes to a lever so that it can raise and lower the lever*  *explore the effect of moving the syringe closer to or further from the pivot point* | Are the children able to:   * construct effective pneumatic systems * know of techniques for fixing components * investigate ways of using their pneumatic systems with other materials to control movement * work collaboratively together to design a team monster (groups of 2 or 3) | syringes, plastic tubing, balloon, small box, cardboard, masking tape |
| 4 | **Investigating and making**   * step by step guide to making a moving monster (storyboard) * to explore ideas through 3D modeling * to think about their ideas as they make progress and be willing to change things if this helps them to improve their work * to plan through discussion | Explain to the children the task, including constraints *eg time, size and materials* and the individual children’s design input on aspects of the monster.  Discuss with the children who the monster is for. *What does it have to do?*  Discuss with the children possible ideas for moving parts *eg moving wings, opening and closing mouth* and for ways of making *eg using reclaimed materials for the structure.*  Organise the children into small teams and ask them to brainstorm ideas, recording them in words and sketches. *What could you do? How could you do this? What do you need to know? What does this product need to do?*  Ask each team to evaluate their ideas, choose one and explain how they are going to make it. *How could you do this? What could you use? What will it look like?*  Ask each team to produce a list of the materials and tools they expect to use. *What will you need? Where will you work? Who will do what? What will you need to do first?*  At certain stages, gather the children together to talk about their work so far, what they need to do next and share successful techniques and good ideas. | Are the children able to:   * apply what they have learnt through IDEAs/FPTs in their designing and making * work together on an appropriate idea generated through brainstorming and discussion of the constraints * plan the stages of their work and record these at the end of the project in a storyboard * work safely and accurately with a range of simple hand tools | syringes, plastic tubing, balloons, small boxes, cardboard, masking tape  egg boxes, wool, paint, buttons (other materials)  glue, scissors |
| 5 | **Investigating and making**   * to work as a team * to choose an idea according to logistical constraints of materials, time, size * to think about their ideas as they make progress and be willing to change things if this helps them to improve their work * to plan through discussion * to work safely and accurately with a range of simple hand tools * to use a storyboard to record the sequence of their work | Continue as week 4 and in addition  during the work, ask the children to evaluate how they went about their work and the strengths and weaknesses of the finished product.  Ask them to record their work in storyboard form showing how they made their monster (refer to step by step guide). | Are the children able to:   * apply what they have learnt through IDEAs/FPTs in their designing and making * work together on an appropriate idea generated through brainstorming and discussion of the constraints * plan the stages of their work and record these at the end of the project in a storyboard * work safely and accurately with a range of simple hand tools | syringes, plastic tubing, balloons, small boxes, cardboard, masking tape  egg boxes, wool, paint, buttons (other materials)  glue, scissors |
| 6 | **Evaluating and developing work**   * self evaluate finished moving monster to original design * to evaluate as a team the product and purpose of improvements | During the work, ask the children to evaluate how they went about their work and the strengths and weaknesses of the finished product.  Ask them to record their work in storyboard form showing how they made their monster. | Are the children able to:   * Know how to evaluate their moving monster creation as a team and suggest improvements and on an individual level.   Out-of-school activities and homework  Children could find out about other air-operated equipment *eg automatic doors, dentist’s drill.* | Self evaluation sheet |

Health and safety

A risk assessment for this activity will need to consider the materials, tools and equipment being used.

In addition, the following points should be noted:

* make sure components are clean and always use sterile syringes that have not been used for medical purposes
* syringe plungers can come out with force, particularly when the syringe being pressed (input) is larger than the syringe being controlled (output)