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| **Lesson 3** | Key question:  |
| **Building on from lesson 2** |  Exploring the stability of different shapes. To identify features that make a shape strong and stable. Creating different shapes to test stability and strength  |
|  **Key DT focus*–*** *Skills developed with guidance* | **National curriculum links:** **Design*** Design purposeful, functional, appealing products for themselves and other users based on design criteria
* Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

**Make*** Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

**Technical knowledge*** Build structures, exploring how they can be made stronger, stiffer and more stable
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| **Teaching Objectives** | To make a structure according to design criteria**Success criteria:** * I can remember that chairs are structures and need to be strong, stiff and stable
* I know how to create joints and structures from paper/card and tape
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| * **Key Vocabulary**:

design criteriaman-madenaturalpropertiesstructurestableshapemodeltest |
| **Resources*** Demonstration chairs made prior to the lesson, as per the teacher video, from the materials your class will be using to make their chairs
* Paper for children to design their chair
* Materials - depending on your chosen options as described in the teacher video, either:
* Paper and masking tape, or
* Plastic/paper straws and pipe cleaners
* Recycled materials
* Zip lock/sandwich bags with names on

\* Pupils could bring in kitchen roll tubes, packaging, specific materials, etc  | **Locality context barriers to learning** New terminology and concepts- go over and teach explicitly what each word means. Desire to want to experiment- not get things wrong- place less confident children with a small group.  | **Protective Characteristics** Could display chairs, stools that represent different cultures, not just chairs that the children might typically see. Think about who the target market could be? Consider pre-making shapes for children who struggle with finger dexterity.  | **Weblinks*** Watch teacher video: *Making Baby Bear’s Chair*
* ‘Goldilocks and the Three Bears’ story - either read the story or watch the video: [http://safeYouTube.net/w/Eybe](http://safeyoutube.net/w/Eybe) (3:30)
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| * **Before the session:** Watch teacher video: *Making Baby Bear’s Chair*
* ‘Goldilocks and the Three Bears’ story - either read the story or watch the video: [http://safeYouTube.net/w/Eybe](http://safeyoutube.net/w/Eybe) (3:30)
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\* Pupils could bring in kitchen roll tubes, packaging, specific materials, etc * **Retrieval task: Ask children to tell each other what they found out last DT lesson? What is the different between strength and stability? Find something in the room that shows stability?**

**Oracy Starter:** Read the story or play the clip of ‘[Goldilocks and the Three Bears](http://safeyoutube.net/w/Fybe)’.Discuss in groups then feedback to the whole class:* Ask children to name the structures they saw in the story (house, table, chair, bed).
* Why didn’t Goldilocks like Daddy Bear’s chair? (It was too big.)
* Why did Baby Bear’s chair collapse? (It wasn’t strong enough.)

**Main teaching Explore** (5 minutes)The class are going to make a new chair for Baby Bear. Select a teddy bear from the class toys and explain that they will use Teddy to test their chairs. Make the point that Goldilocks wanted a chair that was ‘just right’. With this in mind, ask the children to contribute points to a class Design Criteria based on what they have learnt about stability, strength and stiffness. For example:* It must be able to stand without falling over.
* It must be strong so it doesn’t break when it is sat on.
* The structure should be stiff and not bend easily.

Children should also consider:* What colour(s) would Teddy like?
* Would Teddy like a pattern?
* Would Teddy like a back on the chair to help him/her sit up?
* How big would it need to be?
* How many legs should it have?
* What shape should the seat be?

**Demonstrate** (5 minutes)Model for the children examples of finished structures they could make. The teacher video demonstrates the construction of the chairs using:* paper and tape
* straw and pipe cleaners
* recycled materials

Show them how to create some of the joints shown in the teacher video to fix parts of their structure together.**Make** (20 minutes) Provide the materials and let the pupils create their own chair for Baby Bear.**Safety:** * If pupils are bringing in their own materials, check they are not too difficult for them to cut into with their scissors.
* If you are not comfortable with managing too many materials/equipment/ tasks at once, restrict it to just paper and tape.

**\***Before tidying up, provide pupils with zip lock/sandwich bags to store all their parts in.Questions to Ask the children: What is strength?What is stability?What is stiffness?Why are these important?How can you make structures stronger/stiffer/more stable? |
| SEN Provision | **PKF** | WTS | EXS | GDS |
|  **Pupils needing extra support:** Should copy a structure you have made using one joining technique you have shown them, rather than designing their own. They could also use premade cylinders such as kitchen rolls. | **Pupils with secure understanding indicated by:** Working independently to use the materials as demonstrated to begin to make a stable structure. Explaining how their ideas would be suitable for Baby Bear.**Pupils working at greater depth indicated by:** Working independently to produce a more demanding design and working with a wider range of materials and construction methods. Using more complicated joining techniques and producing neat results. Articulating why their designs will be suitable for Baby Bear and possibly identify how it could be made even better.**Pupils working at greater depth:**Should work more independently, producing more varied, demanding designs.Can produce neat, stable structures with a variety of joining techniques.Should work with a wider range of materials.Should experiment with different ideas - taking risks and learning from them. |
| **End of lesson reflection** Ask volunteers to explain their design idea to the class:* The features Baby Bear would like
* Colour choices
* Material choices
* How they have reinforced joints
* How they will ensure that their structure is strong, stiff and stable
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| **Outcomes****Majority To make a structure according to design criteria****Most to independently to use the materials as demonstrated to begin to make a stable structure****Some . Can produce neat, stable structures with a variety of joining techniques.****Should work with a wider range of materials.****Should experiment with different ideas - taking risks and learning from them** |
| **Lesson evaluation notes and next steps** |