



**GENERAL CERTIFICATE OF SECONDARY EDUCATION**  
**DESIGN AND TECHNOLOGY**  
**PRODUCT DESIGN**

**A552/TN**

Designing and Making Innovation Challenge

**PRE-RELEASE TEACHERS NOTES**

**To be opened on receipt**

**JANUARY AND JUNE 2010**



**INFORMATION FOR TEACHERS**

- This document consists of **20** pages. Any blank pages are indicated.

Session 1	Organisational instructions	Must say	Say in your own words
<p><b>IMPORTANT</b></p> <p>180 minutes are available for session 1.</p> <p>The times given in this column are suggestions and may be adapted to suit Centre needs.</p>	<p><b>Before students enter the room.</b></p> <p>Arrange room for students to sit in groups of three/four.</p> <p>Lay out inspiration/handling collection and printed resources. These should be available for both sessions.</p> <p>Place a candidate answer booklet in each workspace.</p> <p>A wide range of modelling/prototyping materials, tools and equipment should be available to students.</p> <p><b>When candidates enter the room.</b></p> <p>Students sit in working groups of 3 or 4 students. Groups to be decided by the teacher.</p> <p><b>Rules of the Innovation Challenge.</b></p>	<p><i>Over the next two sessions you are going to be involved in a D&amp;T activity called the innovation challenge.</i></p> <p><i>Session 1 – Designing</i></p> <p><i>Session 2 – Making</i></p> <p><i>You are doing this challenge to show just how good you are at coming up with new and creative ideas.</i></p> <p><i>By the end of the challenge, your sketches, notes, models and prototypes should show that your ideas would work.</i></p>	<p>It is important that you try your best and feel that you can try any idea out – however crazy or impossible it might seem to start with. Be creative.</p>

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		<p><i>You can develop your ideas in whatever ways you think best – through sketching, writing or making models.</i></p> <p><i>Use whatever ways that will help show your most creative work.</i></p> <p><i>The examination board has given you each an answer booklet to record your progress throughout the challenge.</i></p> <p><i>Although you are not working in an examination hall you must still treat this activity as an examination. You should not talk unless you are told to do so by a member of staff. Part of the examination requires you to explain your work and receive comments from others in your work group. I will explain before this activity takes place.</i></p> <p><i>Teaching staff are here to monitor health and safety and to organise the running of the challenge. Staff are not allowed to give advice or guidance about your design or making activity. However, you are allowed to ask for clarification if you are not sure about a task.</i></p> <p><i>I will explain everything as we move through the two sessions.</i></p> <p><i>Please remember that the examiner will only see the workbook.</i></p> <p><i>It is important that evidence of all thinking, designing, modelling and prototyping (using photographs), is included in the workbook.</i></p>	

Session 1	Organisational instructions	Must say	Say in your own words
	<p><b>Students fill in the following information on page 1 of the answer booklet:</b></p> <p>Candidate name, candidate number and centre number. Fill in the date of session 1 and session 2.</p>	<p><i>There will be times when you will be asked to draw or write particular things in your booklet.</i></p> <p><i>We will be taking photographs of your models as they develop. These photos will be stuck in your booklet.</i></p> <p><i>You must develop your own ideas during these sessions. The 'Reflect and Record' activity will allow you to take advice and suggestions from the others in your group. You will be able to modify your design and incorporate their feedback.</i></p> <p><i>You must complete your own booklet and your own prototype. You must not move forward in the workbook until instructed to do so. You are allowed to return to previously completed sections if you wish to do so.</i></p> <p><i>Fill in the following details on page 1 of the answer booklet:</i></p> <p><i>Candidate name</i>  <i>Candidate number</i>  <i>Centre number</i>  <i>Date of session 1</i>  <i>Date of session 2.</i></p>	

Session 1	Organisational instructions	Must say	Say in your own words
<p><b>5 minutes</b></p>	<p><b>Start the Innovation Challenge.</b></p> <p>Introduction to the context. Read through the challenge with students. (Challenges are outlined on the insert sheet in the workbook).</p>	<p><i>You are now going to start the challenge.</i></p> <p><i>If at any time you don't understand what I tell you, or what you have to do, then ask.</i></p> <p><i>There are four challenges outlined on the insert provided.</i></p> <p><i>I will now read through the situation and task together.</i></p> <p><i>You will now have 15 minutes to make a decision on which challenge you will select.</i></p> <p><i>Write the title of the challenge you select on page 1 of your answer booklet</i></p>	<p>Clarify Insert.</p>
<p><b>15 minutes</b></p>	<p><b>The inspiration and handling collection.</b></p> <p>Introduce the handling collection/resources. Allow a few minutes for students to have a look at, handle and talk about the collection.</p> <p>Introduce the inspirational collection. Encourage students to examine the two collections and ask questions about them.</p>	<p><i>The inspirational and handling collection.</i></p> <p><i>At the end of this 15 minute session you must have selected the challenge that you will complete.</i></p> <p><i>You are allowed to ask questions about any of the items that I am about to show you. How could these items aid your design?</i></p> <p><i>Whilst looking at and handling the items you should think about the four challenges.</i></p>	<p><b>Handling Collection –</b> Talk about the 'wow factor' that makes these products interesting, creative etc.</p> <p><b>Inspirational Collection –</b> Explain why these items have been selected, their inspirational features or use of material.</p>

Session 1	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 1 of the answer booklet</b>			
<b>6 minutes</b>	<p>Box 1. Initial Thoughts.</p> <p>Allow 6 minutes with a reminder after 5 minutes.</p>	<p><i>Remember, from now on you are creating your own ideas. You should not talk.</i></p> <p><i>Open your answer booklet and find box 1.</i></p> <p><i>The first thing we would like you to do is to put some of your first thoughts down on paper.</i></p> <p><i>Remember, we want you to be as creative as possible, so sketch and add notes of any ideas you have, even if they seem a bit risky or outrageous at this stage.</i></p> <p><i>We really want you to feel able to 'let your mind go out to play'.</i></p> <p><i>In this box put down your initial thoughts. You have 6 minutes, so work quickly. Try and remain focused.</i></p>	
<b>The following section should be done in box 2 of the answer booklet</b>			
<b>8 minutes</b>	<p>Box 2.</p> <p>Allow 8 minutes with a reminder after 6 minutes.</p>	<p><i>Look at your initial thoughts. Highlight the areas that interest you.</i></p> <p><i>Think about the challenge you have chosen.</i></p> <p><i>Which three ideas are worth developing?</i></p> <p><i>Then:</i></p> <p><i>Fill in box 2 with three possible design briefs.</i></p>	<p>Explain highlight – draw round, ring, highlight pen, make obvious.</p>

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<b>The following section should be done in box 3 and 4 of the answer booklet</b>			
<b>15 minutes</b>	<p>Box 3 and 4. Decision Time!</p> <p>Allow 15 minutes with a reminder after 12 minutes.</p>	<p><i>Open out the last page to reveal boxes 3 and 4.</i></p> <p><i>Box 3 and 4 will be visible throughout the challenge and you should refer to them from time to time.</i></p> <p><i>Think carefully before you fill out the boxes. Consider all your options.</i></p> <p><i>Decision Time!</i></p> <p><i>Complete box 3 with:</i></p> <p><i>A design brief;</i></p> <p><i>Who your product will be used by;</i></p> <p><i>Where and how your product will be used.</i></p> <p><i>Complete box 4 with:</i></p> <p><i>A full design specification that lists all the key features that you will need to consider.</i></p>	<p>One that you will enjoy doing. One that will show your creative ability.</p> <p>A detailed description of the group of people who will benefit from your design.</p> <p>Explain the environment – where the product might be used and how it might operate.</p>

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<b>The following section should be done in box 5 of the answer booklet</b>			
<b>20 minutes</b>	<p>Box 5. Start Designing.</p> <p>Give a reminder of time after 15 minutes.</p>	<p><i>In a moment you can start designing. You can sketch, make notes and make models. You should produce a range of ideas that satisfy your chosen design brief. Use annotation to communicate your ideas to the examiner.</i></p> <p><i>From now on you may use any of the resources at any time.</i></p> <p><i>Remember, you are creating your own ideas. You should not talk.</i></p>	<p>If you use 3D modelling, or trialling &amp; testing with food ingredients, to develop ideas, you can take photographs and stick them into box 5.</p> <p>Ensure these photographs are fully annotated.</p>
<b>The following section should be done in box 6 of the answer booklet</b>			
<b>10 minutes</b>	<p>Box 6. Review of Ideas.</p>	<p><i>Think carefully about your designs.</i></p> <p><i>What do you think of your ideas so far?</i></p> <p><i>Which is your best idea?</i></p> <p><i>Which is your most unusual idea?</i></p> <p><i>What problems can you see?</i></p>	<p>Check ideas against the specification.</p> <p>Which might not be as silly as it first appears.</p>



Session 1	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 7 of the answer booklet</b>			
<b>5 minutes</b>	<p>Box 7. Reflect and Record.</p> <p>Presentations.</p> <p>Teacher Introduction to the presentations.</p> <p>Same table/group arrangements as before.</p>	<p><i>You will have the opportunity to tell the other students in your group what you are designing.</i></p> <p><i>You can show drawings or card models if it helps to communicate your idea.</i></p> <p><i>Students in your group can ask you questions.</i></p> <p><i>Students in your group can suggest improvements and developments to your idea.</i></p> <p><i>Use the space provided in box 7 to plan your presentation.</i></p>	<p>Explain about the presentations.</p> <p>The value of sharing ideas.</p> <p>Suggesting modifications.</p> <p>Discussing further possibilities.</p>
<b>Group Work</b>			
<p><b>10–15 minutes.</b></p> <p>Timings will need to be flexible due to group size.</p>	<p>Within working groups. (3 or 4 students)</p> <p>Students give presentations of their ideas and receive feedback.</p> <p>Staff to overview process and encourage students to be positive, constructive and fair with time allocations.</p>	<p><i>You are to present your ideas to members of your group. Your presentation should last approximately 2 minutes. 2 minutes of question and answer activity will then take place.</i></p> <p><i>You should make brief notes of your group's feedback about your design to help complete the next activity.</i></p>	

Session 1	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 8 of the answer booklet</b>			
<b>6 minutes</b>	Box 8. Feedback.	<p><i>Record any suggestions made by your working group.</i></p> <p><i>What could you modify?</i></p>	
<b>Break</b>			
<b>15 minutes</b>	<p>Allow students 15 minutes to have a drink, use the toilet, get some fresh air if possible. They may stay in the same room as the challenge if supervised, but are not allowed to work in their booklets or on their models.</p>	<p><i>Close the booklets. No further work can be completed during the break time.</i></p>	

Session 1	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 9 of the answer booklet</b>			
<b>25 minutes</b>	<p>Box 9. Developing your final idea.</p> <p>Allow 25 minutes with a reminder after 20 minutes.</p>	<p><i>You will now develop your final idea.</i></p> <p><i>You may use any of the resources at any time.</i></p> <p><i>Think about size and shape and assembly.</i></p> <p><i>Think about modelling materials.</i></p> <p><i>Think about components</i></p> <p><i>Think about taste and nutrition.</i></p> <p><i>Think about how the product will function.</i></p> <p><i>Remember, you are developing your own ideas. You should not talk.</i></p> <p><i>A photograph (photo 1) will be taken at the end of 25 minutes to record your progress.</i></p> <p><i>Make sure that all development models or trial pieces are included in the photograph.</i></p>	<p>Expand as appropriate.</p>
<b>The following section should be done in box 10 of the answer booklet</b>			
<b>5 minutes</b>	<p>Box 10. Question time.</p>	<p><i>Answer all the questions.</i></p>	

Session 1	Organisational instructions	Must say	Say in your own words
<b>Materials/Ingredients</b>			
<b>10 minutes</b>	<p>Materials/Ingredients</p> <p>Introduction to the prototyping materials/ ingredients available.</p>	<p><i>I am about to introduce the prototyping materials/ ingredients we have, to you.</i></p> <p><i>You are not required to use every material/ingredient provided and only appropriate materials/ingredients for your design should be used.</i></p> <p><i>If you require a specific material/ingredient that is not here you may request it.</i></p>	
<b>The following section should be done in box 11 of the answer booklet</b>			
<b>10 minutes</b>	<p>Box 11.</p> <p>Allow 10 minutes with a reminder after 8 minutes.</p>	<p><i>Having seen the materials/ingredients provided complete each of the sections in box 11.</i></p>	<p>Think about how you will make your prototype. What are your choices? What would be the best? Why?</p>

Session 1	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 12 of the answer booklet</b>			
<b>6 minutes</b>	<p>Box 12. Action Plan for Session 2.</p> <p>Allow 5 minutes with a reminder after 4 minutes.</p>	<p><i>In the next session you will start to manufacture the prototype. Plan what you will need to do during this session.</i></p> <p><i>Do you need any additional materials/ingredients?</i></p> <p><i>Do you need to find out anything that will help you next time?</i></p> <p><i>Record your plan in box 12.</i></p>	<p>Explain to students that they may request additional materials/ ingredients or bring these from home. These must not be modified to aid manufacture in any way.</p>
<p><b>End of session 1.</b></p> <p><b>Booklets should be collected in and securely stored by the examination officer.</b></p>			

Session 2	Organisational instructions	Must say	Say in your own words
<p><b>IMPORTANT</b></p> <p>180 minutes are available for session 2.</p> <p>The times given in this column are suggestions and may be adapted to suit Centre needs.</p> <p>A 10 minute Break is included at the end of making session 3.</p> <p>This may be moved to suit centre needs.</p>	<p><b>Before students enter the room.</b></p> <p>Arrange room for students to sit in groups of three/four.</p> <p>Lay out inspiration/handling collection and printed resources. These should be available for both sessions.</p> <p>Place a candidate answer booklet in each workspace.</p> <p>A wide range of modelling/prototyping materials, tools and equipment should be available to students.</p> <p><b>When students enter the room.</b></p> <p>Students sit in the same working groups as session 1.</p> <p>Rules of the Challenge.</p>	<p><i>In Session 2 of the innovation challenge you will be making your design.</i></p> <p><i>You will have longer periods of uninterrupted time so that you can model/produce your prototype.</i></p> <p><i>You will be producing your design so that you and the examiner can see your ideas.</i></p> <p><i>You should not talk to each other unless directed to do so. Teaching staff are here to monitor health and safety and organise the running of the challenge. Staff are not allowed to give advice or guidance about your design or making activity. However, you are allowed to ask for clarification if you are not sure about a task.</i></p> <p><i>I will continue to explain everything as we move into the final stages of this challenge.</i></p> <p><i>You will be using tools and equipment, so your normal risk assessments must apply.</i></p>	<p>Explain, if necessary, the departments expectations with regard to health and safety.</p>

Session 2	Organisational instructions	Must say	Say in your own words
<p>The following section should be done in box 13 of the answer booklet</p>			
<p><b>5 minutes</b></p>	<p>Box 13.</p>	<p><i>You have 5 minutes to look back over the work you did in session 1.</i></p> <p><i>Look carefully at box 3. Read your design brief, user group and specification.</i></p> <p><i>Are you still on track?</i></p> <p><i>Fill out box 13 (page 7).</i></p>	
<p><b>40 minutes</b></p>	<p>Go Make!</p> <p>After 30 minutes stop the students and tell them they have 10 minutes remaining in this section.</p>	<p><i>You will now have three manufacturing sessions.</i></p> <p><b>Session 1</b></p> <p><i>You have ... minutes to start making your prototype. This time will go very quickly. You must be organised, work efficiently and safely.</i></p> <p><i>A photograph (photo 2) will be taken at the end of this making session to record your progress.</i></p>	

Session 2	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 14 of the answer booklet</b>			
<b>5 minutes</b>	Box 14.	<p><i>Fill in progress report 1.</i></p> <p><i>Be honest about the problems you have experienced.</i></p> <p><i>What are the possible solutions to your problems?</i></p> <p><i>Check that your prototype is photographed (photo 2) and that the photograph is stuck in your workbook.</i></p>	
<b>40 minutes</b>	<p>Go Make!</p> <p>After 30 minutes stop the students and tell them they have 10 minutes remaining in this section.</p>	<p><i>You have ... minutes to continue making your prototype.</i></p> <p><i>A photograph (photo 3) will be taken at the end of this making session to record your progress. Make sure the photograph is stuck in your workbook.</i></p>	



Session 2	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 15 and 16 of the answer booklet</b>			
<b>5 minutes</b>	Box 15 and 16.	<p>Fill in progress report 2.</p> <p>Which areas have been successful?</p> <p>Plan what you need to do in the last 40 minute time allocation.</p>	
<b>40 minutes</b>	<p>Go Make!</p> <p>After 30 minutes stop the students and tell them they have 10 minutes to finish their models.</p> <p>A short break after this final session is designed to aid the taking and mounting of final photographs.</p>	<p>You have ... minutes to finish making your prototype.</p> <p>A photograph (photo 4) will be taken at the end of this making session to record your final product. Make sure the photograph is stuck in your workbook.</p>	
<b>End of making session</b>			
<b>2 minutes</b>	Tidy Workspace. Staff to organise final photographs.	Clear workspace of tools, equipment, materials etc. You need to have adequate space to complete work in workbook.	

Session 2	Organisational instructions	Must say	Say in your own words
<b>Break</b>			
<b>10 minutes</b>	Allow candidates 10 minutes to have a drink, use the toilet, get some fresh air if possible. They may stay in the same room as the challenge if supervised, but are not allowed to work in their booklets or on their models.	<i>Close the booklets. No further work on models until after break.</i>	
<b>The following section should be done in box 17 of the answer booklet</b>			
<b>13 minutes</b>	<p>Box 17. Evaluation.</p> <p>Regroup the candidates at their tables.</p> <p>Allow 13 minutes. Give a reminder after 10 minutes.</p> <p>Fill in box 17.</p>	<p><i>You are about to complete the evaluation of your design and prototype product. Answer the questions in as much detail as possible. Remember that you are allowed to use the additional space in the workbook.</i></p> <p><i>Complete box 17.</i></p>	

Session 2	Organisational instructions	Must say	Say in your own words
<b>The following section should be done in box 18 of the answer booklet</b>			
<b>15 minutes</b>  Box 18.  Allow 15 minutes for this task.		<p><i>This session is due to finish at .....</i></p> <p><i>Look at your original specification in box 4.</i></p> <p><i>Have you done what you set out to do?</i></p> <p><i>Use box 18 to record your thoughts.</i></p> <p><i>Does your design satisfy the specification requirements?</i></p> <p><i>Describe the main features of your product if it was manufactured.</i></p>	<p>Materials, surface finish, colour, texture, smell, etc, as appropriate.</p>
<b>End of Session 2.</b>  <b>Booklets should be collected in and securely stored by the examination officer.</b>			
<b>Time to Reflect</b>			
<b>30 minutes</b>	Between 24 and 72 hours after the challenge was completed – return to page 2 in the booklet.	<p><b>You are not allowed to make any alterations to your workbook.</b></p> <p><i>Now that the challenge has been completed and you have had time to think about what you did, you can fill in the 'Time to Reflect' box on page 2. Sketches, notes and photographs can be used here.</i></p> <p><i>This is not an evaluation of your work. It is a chance for you to review your ideas and put forward any further suggestions you may have had to improve your product further.</i></p>	Explain about strengths and weaknesses.

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