

# Planning: Define the Goal and Mission Design Brief

**Info in red font is for the benefit of the teacher (ideas for differentiated learning etc). Delete text in red font from the copies that are distributed to students. In a document / template that is intended to be "filled in" by students for assessment / evaluation purposes, the Version History table can be retained for students to use. Making an improved version 2 or 3 is great learning and should be encouraged. Show the class how easy it is to automatically generate and modify a Table of Contents using the features of the word processing technology. Because this unit is early in the course, significant review of fundamentals is included in the documents supporting this unit.**

**CC = Significant cross-curricular learning opportunity**

**Version History:**

V #	Date	Author	Short Listing / Description of Changes
1	May 7/12	D.B. McCowan	Initial Version -- uploaded to OCTE Safety Portal
2	June 3/12	D.B. McCowan	Changes are in yellow font: Section 6, correct answer is C Upload to OCTE portal June 8

## Table of Contents

1	Expectations – Preliminary Planning.....	1
2	This Lesson is Important Because – Planning is Key to Success.....	2
3	The Situation – A True Story.....	2
4	Problem or Opportunity? .....	3
5	Constraints – Over Which You Have No Control .....	3
5.1	Constraints vs. Requirements – A Quick Note .....	4
6	Collaborative Decision-Making – Let’s Get Started! .....	5
7	Initial Fact-Finding Research – Consider Constraints, Ask Questions.....	5
8	Decision-Making by Consensus .....	6
9	Set Your Goal / State Your Vision (Design Brief) .....	7
9.1	Version 1 Goal (Design Brief).....	7
9.2	Version 2 Goal (Design Brief).....	7
10	Safety Reminder.....	7
11	Self and Peer Assessment .....	8

### 1 Expectations – Preliminary Planning

<b>Design / Build a Marketable Picture Frame Using Scrap Wood Flooring</b>	
<b>1</b>	<b>2</b>
<b>Curriculum Expectation</b> <i>In this unit the student will demonstrate / practise the following:</i>	<b>Activity -- What You Will Do in this Lesson</b>
B1.2 -- plan and organize projects and related activities using a design process	-interpret a situation -recognize an opportunity or a problem to solve

<b>Design / Build a Marketable Picture Frame Using Scrap Wood Flooring</b>	
<b>1</b>	<b>2</b>
<b>Curriculum Expectation</b> <i>In this unit the student will demonstrate / practise the following:</i>	<b>Activity -- What You Will Do in this Lesson</b>
and appropriate methods and tools	<ul style="list-style-type: none"> <li>-make some value-added observations and ask questions (initial research)</li> <li>-integrate new knowledge with existing knowledge</li> <li>-distinguish between requirements and constraints</li> <li>-brainstorming and collaborative decision-making by consensus</li> <li>-accept the challenge by concisely communicating your goal and defining a focus in a design brief – state why your product or solution is so important?</li> </ul>

## 2 This Lesson is Important Because – Planning is Key to Success

The design – and the “problem-solving” -- process first involves clearly identifying the problem or opportunity. Your first step in design project planning is to ask enough questions to get an initial understanding of the problem / opportunity. Process new information, integrating with existing knowledge. Clearly and concisely state the problem in your "Design Brief" along with your goal in relation to the problem.

Of course, at this point, also get your strategy together for how you will store and track your project design work – ie plan your *Design Portfolio* as well.

## 3 The Situation – A True Story

*The beautiful 1917 Queen Anne style Ontario farmhouse was to be demolished. A great-grandson of the original farmer-owner received permission to carefully salvage oak flooring, panelling, door and window casings etc. Much of the woodwork has now been integrated into a new residential construction project – but there are parts left over....*

**Built 1917**



**Scarborough, Ontario**



*An old but solid two foot diameter white ash tree was recently killed by the emerald ash borer. The tree was cut, milled, dried, heat treated, and planed into ¾ inch flooring. The flooring has been installed ... and there are parts left over...*

#### 4 Problem or Opportunity?

Now interpret and analyse the above situation. With some critical and creative thinking, you can transform a simple "situation" (or it could have been a set of your personal observations) into a vision or goal that you believe would be great to bring into reality. First, ask some questions to gain additional clarity, for example:

1. Which oak parts are available and how many of them? How much ash flooring?
2. What's the cost to get these 'spare' parts?
3. Were the oak parts cleaned and heat treated? Have the nails been removed?
4. What could these parts be used for?
5. Can we make money by making marketable products out of these parts?
6. Can we use these new products as a fundraiser for an important school cause?
7. What else might we need in order to translate this situation into an achievable opportunity?
  - a. What do we need to know?
  - b. What do we need to be able to do?
  - c. What do we need to communicate to others?
  - d. What little problems might we encounter along the way?

#### 5 Constraints – Over Which You Have No Control

Here are answers to a few of the above questions:

1. You can have all of the left-over oak flooring (mostly under two feet long) -- free. (Nails are out and it has all been heat treated, but you might want to clean it up again and do some sanding.) You can have all of the left-over ash flooring -- free. You can't have anything else.

These are **constraints** or limitations – you have no control over these matters.

Your teacher – or your manager in real life – will probably add more constraints or restrictions such as:

2. You must make your product in the school shop
3. You can only use hand tools
4. You can have additional parts to make your own product that cost a maximum of \$5.00 total for a student's product
5. The class must decide, as a team, that all students will make one particular **kind** of product out of the oak and / or ash flooring
6. The class must work together to define the **requirements** for the product and to otherwise design the entire opportunity
7. The product be something that has general public appeal – ie marketability

**NOTE:** The teacher will have very good reasons for adding constraints such as these. But the teacher may not to share those reasons with you 'up front'. The teacher wants you to discover those reasons as you work as a team from situation to finished product.

### Wood Fired Hydronic Kiln, 2012



**Oak, milled before 1917**



**White Ash, milled 2008**



### 5.1 Constraints vs. Requirements – A Quick Note

A constraint is not the same as a 'Requirement'. You have no control over constraints. In the next couple of lessons, you will see that it is your job to set your own requirements – and you will then aim to achieve them to the best of your ability! Some of your requirements may be more important than others. If necessary, you can even change your requirements as your project progresses, but be sure to justify these decisions. In other words, you do have some control over your own requirements.

## 6 Collaborative Decision-Making – Let's Get Started!

Let's suppose your teacher did impose constraint number 5 above, "*the class must decide, as a team, that all students will make one particular **kind** of product out of the oak and / or ash flooring*".

### **Question – Knowledge:**

- 1 What do you do as a class?
  - a) Ask the teacher to make a decision on your behalf
  - b) Tell the teacher that you don't like constraints – you want to do whatever with whatever
  - c) Look closely at the available flooring (photos above) and start brainstorming – what is possible?
  - d) During brainstorming, focus on the teacher's other constraint, "you can only use hand tools"

Remember, *you already know more than you think you know*. You already know, from your lesson on the design process, that brainstorming is very unstructured -- an "anything goes" kind of discussion process. As a class, you will be very open-minded in looking for an opportunity.

The correct answer to the above question is C.

## 7 Initial Fact-Finding Research – Consider Constraints, Ask Questions

Suppose you have five possible kinds of products on the list that you output or generated from your brain-storming session, for example book ends, picture frames, napkin holders, salt-shakers etc. Now is the time to consider the other constraints from the teacher – hand tools, cost of additional parts, marketability.

### **Initial Research Activity – Planning:**

2 The class will divide themselves up into one team for each of the possible products. Each team will divide up the initial research on their possible product according to each of the 3 major constraints from the teacher. Students will keep their personal interests in mind as they choose their research task – always consider your own career goals as you work on an assignment. Someone in the class will be appointed to fill in the table below **with student names**. Notice that the class can translate the teacher's constraints into different words to give more focused direction to the research. You can add additional research questions – after all, as a class you will be make an informed decision through consensus. To make an informed decision, you need enough useful information.

Product Type	Research Question / Constraint			
	What Else Would Be Needed?	What's it Take to Build It?	Will People Buy the Product?	Define Another
Picture Frames	<i>Insert name of student in each cell</i>			
Salt / Pepper Shakers				
Book Ends				
Napkin Holders				
Knife Caddy				
Pick Another				

**Questions: Thinking**

3 Which of the 13 fundamental concepts of technology most closely matches 'What Else Would Be Needed'? Justify your answer, ie your decision.

- a) Mechanism
- b) Structure
- c) System
- d) Safety

4 When you say 'What's it Take to Build It?', to which of the 13 fundamental concepts of technology are you referring? Justify your answer, ie your decision.

- e) Ergonomics
- f) Fabrication
- g) Safety
- h) Control

5 Consider the following statement: The matter of 'Will people buy the picture frame?' has more to do with Function than Aesthetics. In a 100 word paragraph explain why you either agree or disagree with this statement.

**8 Decision-Making by Consensus**

Ok, let's say all students have completed their research task. Now, as a class you will consider all of the research findings and make an informed decision as to what kind of product you will all make using the scrap flooring. First, you will need to have an agreeable process for making your decision. For example, you may wish to rank each product type vs. constraint on a scale of one to ten, with higher numbers being "good" -- the product with the highest total score is chosen. In

the final analysis, consensus means that all students in the class will generally have a pretty good feeling about the decision. A few students may have preferred another product type, but they're basically **satisfied** with the type chosen. During the consensus-building you may resolve some of the objections that students raise.

Let's suppose your class decision was to choose the Picture Frame product option. **NOTE:** Making a picture frame still offers a wide variety of options in terms of what it will look like and how it is made – you still have lots of opportunity to exercise your creative thinking and problem-solving skills.

## 9 Set Your Goal / State Your Vision (Design Brief)

Now the class will state their goal in the Design Brief. The purpose of your design brief is to give you a focus – to remind you of why your product or solution is so important. Your design brief is internal to your team – it is not meant to impress anyone outside the team. Your design brief has nothing to do with 'how' you will make the product. Your design brief has nothing to do with details of what your product must look like or how it must behave.

### 9.1 Version 1 Goal (Design Brief)

*Our goal is to make a class set of picture frames. The picture frames must be made of scrap wood flooring using only hand tools. The picture frames must be sold at a price of \$20.00 each. The picture frames must be rectangular.*

### 9.2 Version 2 Goal (Design Brief)

Anything wrong with the above version 1 design brief? Lots! Now, re-state the class goal in a better way -- but just what you need in order to keep you focused throughout the project. And, beware, you are not designing the product yet. Don't limit your options at this stage either.

**Assignment -- Insert your Improved DesignBrief\_Version2 here:**

## 10 Safety Reminder

The product must be safe.

Date \_\_\_\_\_

Portfolio For \_\_\_\_\_

Page \_\_\_\_\_

## 11 Self and Peer Assessment

NOTE: In the feedback, the Peer Assessor must “make the student think” – not give the student the answer! Be sure to include comments justifying the assessment value that you are giving. Peer Assessor must put his / her comments in red font.

**Assessor’s Name and Additional Notes:**

--