Teaching

Preliminary Design and Technology Stage 6 Success!

Name:_____

Welcome to Teaching Preliminary Design and Technology- Stage 6 Success.

I hope you have an amazing day here and walk away feeling as though you have gained a great deal of value from this course.

This course contributes to 5.0 hours of QTC Registered Teacher Professional Development. It addresses standards 2.1.2 and 6.2.2 at Proficient Teacher accreditation level in NSW, Australia. Please don't forget to sign the attendance sheet and add your Teacher Accreditation Number so we can provide this information to NESA.

The feedback forms you fill in go to NESA too. Please ensure you name is on them as well.

All resources will be available via the Teacher Professional Development website.

Please feel free to ask any questions as we go through the content.

Today's Agenda:

Introduction	9.00-9.30
Session 1 Design Thinking	9.30 – 10.30
Morning Tea	10.30-10.50
Session 2 Creative Approaches	10.50 – 11.50
Session 3 Projects and Portfolios	11.50- 1.30
Lunch	12.30 – 1.10
Session 4 Exam tips and tricks	1.30 - 2.45
Certificates, Feedback and Farewell	2.45 – 3.00

Plenary Ideas:

Syllabus Dot Point	*Activity*
P1.1, P4.1	***Collaborative Chaos:*** Students are given post it notes and need to record the following for their new design problem: Problem, Top Features, Market, WOW factor, Pain points. This is a good way to unpack the design brief. Students add their responses to the board. This can be done specifically for Criteria for success, Factors Affecting Design. Students can then determine which ones they feel are the most or least important.
P3.1	***Design a Chair:*** The 5 Chairs activity encourages students to design models of chairs based on design needs they get from user profiles. This activity also encourages students to iterate on their designs and practice using different materials.
P1.1, P3.1, P5.2	***Lunch Challenge:*** This is a good way to introduce students to Design Thinking as students must design for a specific user. Students are in pairs; teacher is to guide the class through the activity. Students must adhere to the time limits.
P2.1	***What do I know? Production Settings*** This activity can be used to when introducing design and production settings. Divide the class into FOUR groups. Each team is given a design setting: domestic, community, industrial or commercial. Each group is to write down everything they know about designing in that setting.

P3.1	***Two heads better than one?*** Students are put into teams of 3-4 depending on the class size. Groups are to debate "Are two heads better than one?" Are designs produced by a collaborative team more successful than one produced by a lone designer? Students can decide which point of view they will take, or the teacher can appoint Negative and Affirmative teams. Students can use the cognitive organiser Stair Steps to plan their response. This can also be completed as an individual extended response.
P5.3	***Fast Five: Research*** Give students two post-it as they walk into class. Students are to identify one research method that works for them and one that doesn't. Students add these to the board for discussion.
P1.1, P3.1	**Slide down the line** Room set up in two rows: row A and B, chairs facing each other. 1. Ask reach student to write down a challenge/issue they are facing completing the current design project. 2. Students in row A are to share their challenges with row B who are the advisors. The advisors are to provide suggestions to assist with their partner's problem. 3. Students in row A record their ideas down. All 3 mins for discussion. 4. Students in row A rotate while row B stay in their seats. Repeat the above process with a new partner.
P3.1, P5.2	**Take Four** This activity can be used as a cognitive organizer, to summarise content or review key concepts or terminology. It encourages individual reflection as well as cooperative learning. 1.Use the Four corner template to provide questions or statements on a topic.

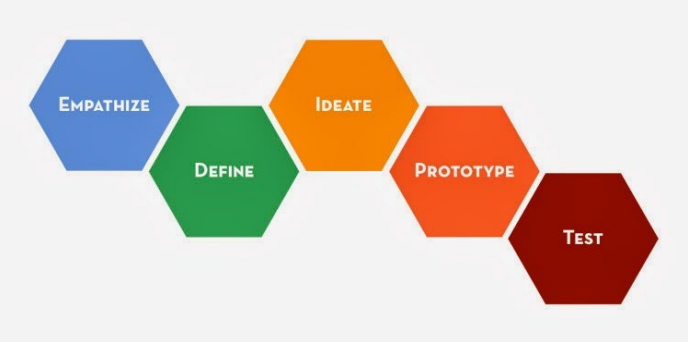
	2. Give students time to complete the template, they should complete all four corners. 3. Divide the class up into four groups. Each group is a different corner. Give the class 3min each corner to share ideas and record other possible solutions.
P4.3	**Ideas expo** This can be used in the initial stages of brainstorming ideas for a design project or can be used when refining ideas. 1. Students complete a brainstorm of possible solutions to the design problem. This should include words, graphics, photos to assist in developing possible design solutions. 2. These brainstorms are displayed around the classroom. Students visit each brainstorm giving feedback and asking clarifying questions to help the designer refine their ideas.
P5.2	**I got it! / Please explain** Five minutes before the end of the lesson, ask students to fill in either an "I got it!" card or "Please explain" card. These will allow you to identify who understood the content/ concept of the lesson and who needs more clarification.
P2.2	**Consequence wheel** The consequence wheel identifies the 6 environmental and social issues outlined in the syllabus: - Personal values - Cultural beliefs - Sustainability - Safety and health - Community needs - Individual needs - Equity

	Teacher or students can choose successful design solutions from the image pack. Students take turns at spinning the wheel and explaining how that issue impacted on the design and production of their chosen design solution card. This can be done as an oral or written activity.
Various outcomes	**Verb of the week** Each week/fortnight students can be introduced to a new verb, using the verb of the week sheet. Each verb has been matched with a syllabus outcome, you can mix and match these depending on where you are up to in the syllabus. Model the example on the board and try to incorporate the verb throughout your lessons in that week.
Various outcomes	**Homework Book** This idea was designed by Cary Hart. Purchase a set of small exercise books (one for each student). Paste in the instructions. Students will use this book to complete exam responses. Each week choose a question or two from past examination papers.

Session 1

DESIGN THINKING

Design Thinking



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The main aim of Design Thinking is for designers to gain a deeper understand of the users needs. This model can be used to create alternative strategies and solutions that may not be instantly apparent. Design Thinking provides a solution-based approach to solving problems. It is a way of thinking and working as well as a collection of hands-on methods.

Below is a quick look at the FIVE phases. It is important to note that these phases do not need to be sequential.

EMPATHISE	Who is your user? What do they want? What do they need? When do they require it?
DEFINE	Define your parameters, criteria for success and any preliminary research. Management plan: time, action, finance.
IDEATE	Research Design Development Peer/ User feedback Generation of final solution
PROTOTYPE	Build your final solution Document implementation prcoess
TEST	Share your solution with others to gain their feedback. Testing of final solution against criteria for success. Peer and self evaluation

Let’s stop talking about THE design process

Carissa Carter
Follow

Oct 7, 2016 · 7 min read

photo cred: Enric Martinez on Flickr

But, before we think about design, let’s talk about cooking

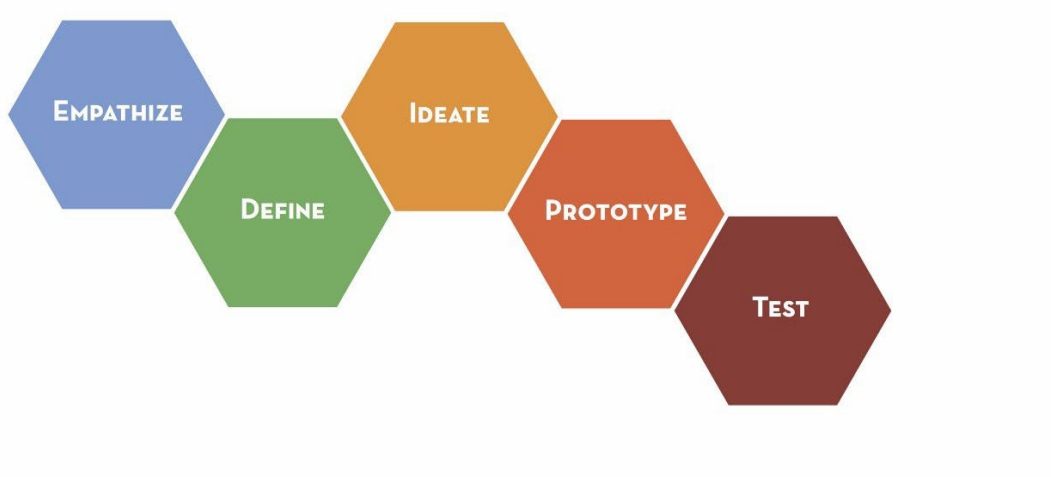
When you first learn to cook something, you might follow a recipe. You are told what ingredients to use in what quantities and instructed on how to combine them. As you get better, you begin to swap out ingredients, you stop measuring, and you pre-heat the oven without looking up a specified temperature. When you’re really good, you invent recipes based on what you have on hand, a new ingredient that’s piqued your interest, the needs of those you’ll be sharing the meal with, the vegetables that are in season, et cetera.

The order and process of a recipe helps new cooks get started, but it’s only with practice, inventiveness, experimentation, and constraints that you might begin to call yourself a chef.

I see design (thinking) in the same way. It’s a beautifully accessible subject. Unfortunately, the accessibility of design is often confused with shallow ease and many (most?) organizations that set out to incorporate it into their company culture struggle with adoption because of this fundamental misunderstanding of the rigor behind the subject.

We saw over 1000 students at the d.school last year and I feel a huge responsibility to get design education right. As many of our students will graduate into organizations that hope to have designerly ways of working, and many companies look to the d.school to inform their own methodologies, I'll offer some thinking from my perspective:

Our pedagogy has evolved from the days of five hexagons.



The problem with the hexagons is that they've created THE design process, and that sounds grand and all encompassing, but in reality they are just a first recipe, a suggestion for how to get started. Behind the hexagons are a starting set of tools to experiment with in each of those modes as well as a set of mindsets and behaviors to embody and try on while doing them. While it is sometimes useful to give students a recipe experience with their first encounter with design, I see our most exceptional instructors creating the tools and experience arcs they need specific to the projects and learning goals of the moment.

From process to ability

At the d.school we endeavor to enable our students in **eight core design abilities** so that they might develop their own creative confidence and also inspire others, take risks, and persevere through tough projects throughout their lives. We want our students to be their own unique chefs. We don't want to churn out individuals that only know how to follow a recipe. Remember when Michael drove the car into the lake?

Through hands-on projects in our experiential learning-style courses students gain practice in these **eight abilities** via a wide range of tools, methods, projects, mindsets, behaviors, artifacts etc.:

Navigate Ambiguity

This is the ability to recognize and stew in the discomfort of not knowing, and then come up with tactics to emerge out of it when needed.

Design is loaded with uncertainty. There are important skills to learn such as being present in the moment, re-framing problems, and finding patterns in information. Ambiguity can arise within a

project, a process, within oneself etc. It's as important to put students in ambiguous situations as it is to give them tactics to emerge from them.

Learn from Others (People and Contexts)

This ability includes the skills of empathizing with different people, testing new ideas with them and observing and noticing in different places and contexts.

Recognizing the opportunity to, and then learning from others is something that happens throughout a design project, both with end users as well as other stakeholders and team members. There is a sensitivity to others that develops with this ability.

Synthesize Information

This is the ability to make sense of information and find insight and opportunity within.

Data comes from multiple places and has many different forms, both qualitative and quantitative. This ability requires skills in making frameworks, maps and abductive thinking. This ability is hard for new students as it takes time and is co-dependent with navigating ambiguity.

Rapidly Experiment

This ability is about being able to quickly generate ideas, whether written, drawn, or built.

Brainstorming is a tool within this ability. It's about letting the doing lead your thinking, and leading with your hands. In order to rapidly experiment you need to be able to relax your mind into a mode of acceptance and generation and eliminate the natural tendency to block ideas that don't seem on point or feasible. This ability naturally pairs with Learn from Others. In many instances you are experimenting both by generating a flood of new concepts at low resolution but also by trying some of those concepts in context with potential users.

Move Between Concrete and Abstract

This ability contains skills around understanding stakeholders as well as zooming and expanding on product features.

Everything is connected. When students are building out a new concept, whether a product, service, experience, etc., they need to be able to nest the concept within the larger ecosystem that relates to it. We have Ray and Charles Eames to thank for helping us set the scene for this ability, but it also includes abstracting out for meaning, goals, and principles, as well as zooming in to define details and features.

Build and Craft Intentionally

This ability is about thoughtful construction and showing work at the most appropriate level of resolution for the audience and feedback desired.

Details matter when you're bringing an idea to life, no matter if the medium is cardboard, pixels or text. Furthermore, there are many sub-disciplines of design, each with their own set of tools and techniques. UX designers have a set of tools specific to creating human-centered digital interfaces. Architects have an arsenal of techniques to bring new structures into the world. Every other discipline: immunology, macroeconomics, K12 education, etc. has its own methods as well. This ability requires a sensitivity to the tools needed to create beautiful work in the domain that you are working in.

Communicate Deliberately

This is the ability to form, capture, and communicate stories, ideas, concepts, reflections, and learnings to the appropriate audiences.

Communication happens in a variety of contexts. This includes reflecting on your performance to a project team or crafting a video to show your product to a potential investor. As we practice experiential learning at the d.school, communication and the storytelling within, are paramount.

Design your Design Work

This meta ability is about recognizing a project as a design problem and then deciding on the people, tools, techniques, and processes to use to tackle it.

This ability develops with practice. We see it emerge in our more experienced students. It requires using intuition, mashing up tools and developing new techniques for the challenge at hand.

There is no THE

Though we live in the age of urgency, mastery takes time, patience, and practice. So, while I think it often makes sense to introduce first-timers to design by following a process, remember that it's not THE process. It simply gives them a small taste of the abilities designers flex. Design as a discipline is evolving and becoming a sophisticated catalyst for positive impact on projects big and small, but the road to results is far from formulaic.

Design a chair

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Goal: To encourage students to gain confidence focusing on designs based on human needs, while working with different materials.

Design Thinking Modes: Empathy, Define, Prototype, Test

Duration: 45 minutes

Group Size: Groups of 3-4 working individually and in groups.

The 5 Chairs activity encourages students to design models of chairs based on design needs they get from user profiles. This activity also encourages students to iterate on their designs and practise using different materials.

Materials:

- Client cards
- Sharpies
- Paper
- Scissors
- Corrugated Cardboard
- Pipe Cleaners
- Modelling Clay
- Tape
- Toothpicks

Instructions:

EMPATHISE:

- Get students into groups of 4
- Pass out client cards, one per group
- Have students highlight two needs they see in the description of their user.

DEFINE:

- As a class discuss the types of functional and aesthetical criteria you may need to successfully complete this project.
- Each group comes up with functional and aesthetical criteria for success.
- Share your criteria with another group to gain feedback. Make any changes.

IDEATE:

- Students complete the following ideation activities.
    1. Draw a Chair (3 minutes)
       Using the provided Sharpies, draw three sketches of a chair on a piece of paper.
    2. Cut a Chair (5 minutes)
       Using ONLY your scissors and the sheet of corrugated cardboard, make a standing representation of your chair.
    3. Bend a Chair (4 minutes)
       Using as many or as few of the provided pipe cleaners, to make the structure of your chair.

PROTOTYPE:

- Mould a Chair (5 minutes)
  Using the provided clay, make a model of your chair.
- Assemble a chair (5 minutes)
  Using tape and toothpicks, build your chair.

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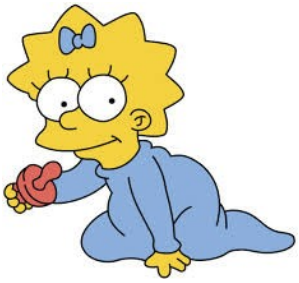
TEST:

Possible discussion questions to be completed as a class or in groups. (5 minutes)

- What was it like to build your chairs for the needs you identified?
- What was it like to create different iterations of your design?
- What did you change along the way? What did you learn from your prototypes?
- Did anyone get stuck at any point? What was that like? What did you do to get unstuck?
- Which material did you enjoy working with the most? Why?
- Which material did you like the least? Why?
- Which material best expresses the essence of the chair your drew?

Grandpa is an old man who is achy and sometimes a bit grouchy. He has trouble getting around, so he walks with a cane. He also has difficulty getting into and out of his chair, though he sits in his chair most of the day.

Ralph is a high schooler who spends 8 hours a day in class. Most of the time, Ralph has to sit in uncomfortable chairs, sitting up straight and facing the front of the room. When Ralph moves between classes, he carries a large backpack. When he gets to class he needs a place to put his stuff.



Maggie is a 1 year old who loves to play and crawl around everywhere. Maggie likes to explore on her own and be independent while she sucks on her binky. When it's time for her to sit still she gets whiny and squirmy.

Neil is an astronaut who travels to space. When he is in his spaceship, he is in a weightless environment. This is cool most of the time, but it is a challenge when he needs to sit down and drink his Tang. Neil also has a bulky space suit that often gets in the way.

Lisa is a marathon runner who runs every single day. She hates being stationary, and because she exercises so much she has really sore muscles. When she finally does sit down it's really important that her chair be very comfortable to help her relax and recover for her run the next day.

Quick Design Challenge -

Students put in pairs. Your task is to re-design your partners' lunch experience.

Empathise

1. Take ONE minute to reflect on your lunch experience: Circle where you are on the continuum, explain why you have chosen this.

2. Interview your user: Describe your current lunch experience. (THREE minutes)	3. Dig deeper interview: Describe your ideal lunch experience. (THREE minutes)

Define – Reframe the problem

1. What does your partner need to accomplish during lunch? (Needs V Wants) (TWO minutes)

2. Insights: New learnings about your partner's feelings and motivations. What's something you see about your partner's experience that maybe they do not see? (TWO minutes)

3. Establish the top 5 criteria. Consider function and aesthetics. (FIVE minutes)

Ideate – Generate a range of ideas to prototype

1. Sketch 5 ways to meet your user's needs. (FIVE minutes)

2. Share your ideas and gain feedback from the user. (FOUR minutes) Try not to explain or defend your ideas, your aim is for honest feedback.

Ideate – Based on feedback

1. Sketch the final solution you feel best fits with your user's feedback. Try to provide as much detail and colour as possible. (THREE minutes)

Build and test

1. Make something your partner can interact with! If your solution is a service or a system create a scenario that allows your partner to experience your solution.

2. Share your solution with your partner and get feedback.

What did they love??	What could be improved??
Ideas for further changes:	Gain insight from another person:

Factors affecting Design:

- **Appropriateness of the Design Solution:** A designer must consider the appropriateness of the design solution. Will it satisfy the need?
- **Needs:** Needs are those things a person must have in order to survive. Perceived needs are things that a person feels they must have. Most designs appeal to the perceived needs of an individual. When designing you must to address the needs of individuals, community and target market needs and wants.
- **Personal values:** Values are those things we regard highly and are important to us. A designer's choice of design is a reflection of what they deem important and of what they value.
- **Function**: A designer must make sure the design works for its intended use. Function can be assessed using the following factors: safety, strength, ease of use, efficiency, simplicity, durability.
- **Aesthetics**: Refers to the beauty of the design.
- **Cost:** The cost of the design encompasses financial costs of production, environmental costs and social costs.
- **Ergonomics:** This is the study of the relationship between people and their physical environment. Designers need to consider the application of their design and how it will interact with people and the immediate environment.
- **Use of Design:** This refers to how the design will be used, who will use it and are there any special needs or requirements that the user has.
- **Sustainability:** If a design uses resources that can be replaced by natural processes in a relatively short space of time, it is considered a renewable resource. Sustainable development can be defined as development that improves the total quality of life, both now and in the future.
- **Energy:** Energy is used to create, produce, market and consume designs. The amount of energy used is directly dependent on the value of the end product.
- **Recyclability:** refers to the ability of an item to be broken down after it serves its use.
- **Safety and Health:** The safety of a design in terms of its production, use and disposal will influence its success. The design should not pose any health hazards to the designer, producer or consumer.
- **Quality:** The quality of the design is a major marketing tool and is studied in two dimensions: The level of quality and the consistency of quality.
- **Short-term and long-term environmental consequences:** Designers need to consider how their work impacts on the environment. This can be done by minimising short-term environmental impacts by selecting resources that produce minimal waste and pollution. Long-term consequences can be addressed conducting a life-cycle analysis and having a focus on sustainable resources.
- **Durability:** The ability of a design to last for its designated life.
- **Obsolescence:** refers to when the design is no longer of any use and must be discarded or recycled.
- **Lifecycle Analysis:** refers to the analysis of a design at all stages from conception to disposal to determine the cost in terms of resource usage.

Research Know How-

Research is an essential part of the design process but often the part that is least enjoyed by students. Getting into the designing and producing of a project is where most students want to start. Encouraging students to complete relevant and varied research can be difficult. Here are a few points to assist students in completing research to the best of their ability.

- WHAT DO I WANT TO KNOW? Spend a few minutes deciding on what areas you need to research as well as the type of research you want to gain. Do you want facts and figures (quantitative) or an opinion on something (qualitative)?
- HOW WILL I DO THIS? For each research topic, write down two possible research methods that would be suitable. Encourage students to vary their methods as much as possible. This provides more relevant and accurate research and also makes it more interesting to complete.
- HOW ACCURATE IS IT? For your internet research, try using two search engines to see how similar your search results are. Use quotation marks to focus your search. Take notes from multiple sites, comparing the information gathered. This is where you may pick up any holes in your research.

SCAFFOLD FOR RESEARCH:

Research topic	Make it clear exactly what you are hoping to find out.
Reference	Make sure you include all references used.
Retell	Summarise your information Outline the major ideas Describe the most significant and relevant concepts What parts are confusing or unclear?
Relate	Make connections between other types of research you have collected. Can you see the same major ideas coming through?
Reflect	Was this text helpful in completing your project? Do you feel this research is accurate? How might you apply what you have learnt?

RESEARCH TEMPLATE:

Research topic: Make it clear exactly what you are hoping to find out.	
Reference Make sure you include all references used.	
Retell Summarise your information Outline the major ideas Describe the most significant and relevant concepts What parts are confusing or unclear?	
Relate Make connections between other types of research you have collected. Can you see the same major ideas coming through?	
Reflect Was this text helpful in completing your project? Do you feel this research is accurate? How might you apply what you have learnt?	

Session 2

Creative Approaches to Design

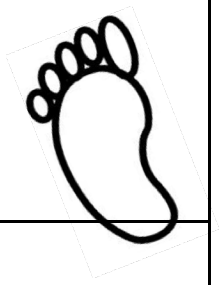
Cognitive organisers:

De Bono's Thinking Hats

De Bono's Thinking Hats: This is an example of a co-operative structure which can be useful in generating design ideas. It encourages learners to think more richly and comprehensively. De Bono believed arguing was a waste of time, so to overcome this problem he divided our thought patterns into six areas to assist the group to think in the same way. He called this innovative thinking pattern "the Thinking Hats". This consists of 6 hats: Blue, White, Yellow, Green, Black, and Red.

Hat	Explanation
White	White hat thinking focuses directly on the available information. What information do we have? What information is missing? How do we get the information we need?
Red	The red hat is for emotions, feelings, hunches and intuition. What do you like about the ideas? How do you feel about this? What don't you like about this?
Black	The most used of all the hats. The black hat is concerned with truth and reality. The black hat is the hat of critical thinking. Is it true? Does it fit? Will it work? What are the problems with this idea?
Yellow	The yellow hat is full of hope—but as it is a logical hat the reasons behind the hope must be given. This hat seeks to find the benefits. What are the benefits? Why should it work?
Green	The green hat is the active hat. It is used for creative thinking. It is concerned with new ideas, alternatives and solutions. What is the need? What are the new alternatives or ideas?
Blue	The blue hat is the overview. With the blue hat you are reflecting on the thinking you have done. Where are we now? Where have we been? What sort of thinking is needed?

The ten thinking tracks

Track 1. What is it?	Clearly describe the issue, product or problem you want to think about.
Track 2. Knowledge 	What do we already know? What do we need to know more about? How can we find out what we still need to know? Is this similar to anything else we already know about?
Track 3. Bright side	What are the good features of this? What positive outcomes might there be? What good opportunities might this provide? 
Track 4. Downside	What are the negative features of this? What problems might happen?
Track 5. Feelings	How does this make us feel? How might this affect the feelings of any of the people involved?
Track 6. Improvement	What changes could make this work better? What could be added, removed, reduced or altered to improve it?
Track 7. Thought Police	Ive we made any assumptions that could be challenged? Do we have enough evidence for what we have been saying? What unanswered questions are there?
Track 8. Is it fair?	Are there any safety issues involved? Have we considered the impact on individuals, society and the environment?
Track 9. I think...	What opinion does each person have about this and why? ("I think...because...")
Track 10. We think...	What is our group decision? What are our three main reasons for the decision? Can we sum up the opposite point of view? 

Blooms Taxonomy

Remembering

Factual answers, recalling and recognising information.

Understanding

Translating, interpreting, showing, understanding.

Applying

Using information gained in different situations.

Analysing

Break into parts to examine more closely.

Evaluating

Judge, use criteria, rank, substantiate.

Creating

Combine information with new situations to create new products and ideas.

Positive

Negative

Interesting

This works by the designer listing all of the pluses, the negatives and any interesting points related to a concept, design or proposal. This analysis can be applied to a wide range of objects and ideas.

Idea 1:

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Idea 2:

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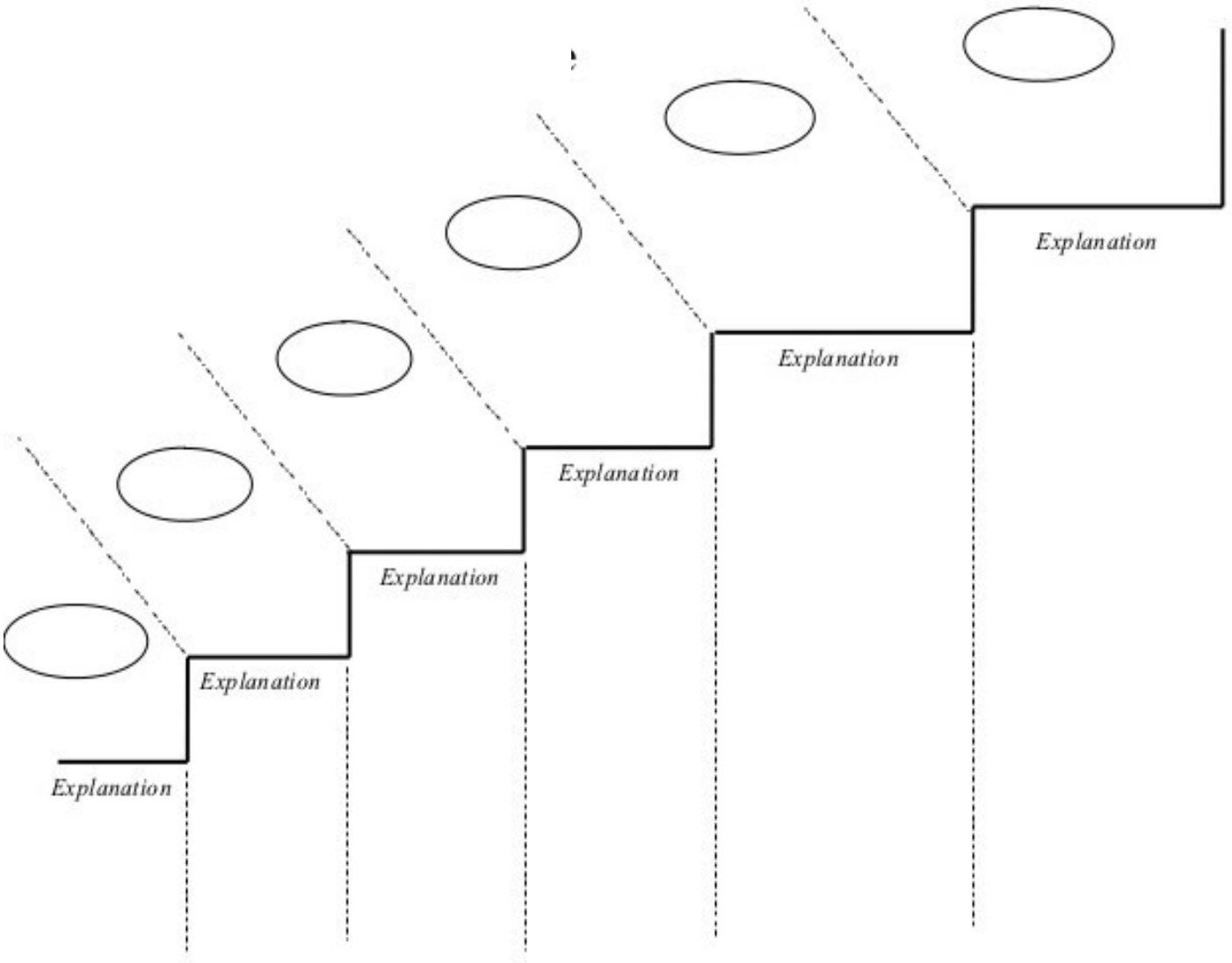
Are two heads better than one?

Do designers work at their best alone or are they more creative when paired with others?

Decide on which side you are taking and build your argument to present to the class.

Use the cognitive organiser Stair Steps to plan out your points for the debate. Stair steps can be used when a topic involves a step by step process, or for plotting a course of action.



COLLABORATIVE CHAOS

Problem	Top Features (What are the most important features your PSE needs to have.)	Market (what type of individual/group are you targeting?)	WOW factor (What is going to impress the target market?)	Pain points (What do you think will be difficult to achieve?)
Students are regularly complaining about the functionality of the school lockers. They also need a facelift… can you help??				

Designing in a commercial setting

Case study:

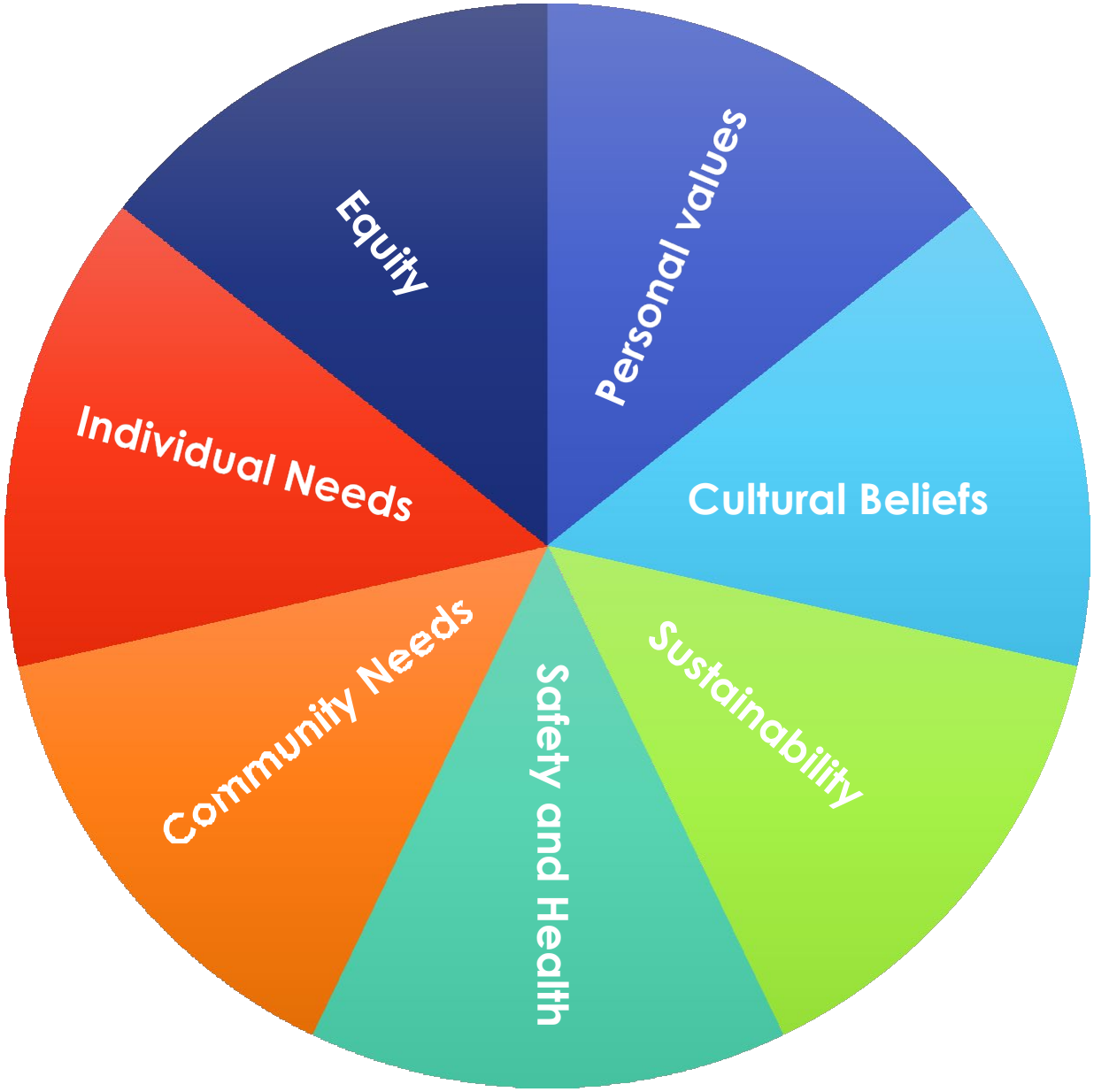
Jake Williamson is an up and coming Melbourne designer who is creating locally-made furniture produced with certified Tasmanian Oak. His purpose: to create "beautiful, functional pieces that do not break the bank." Jack's brand Peninsula offers affordable, sustainable handmade furniture at an affordable price.

Australian products that are handmade and use high quality materials often acquire a large price tag due to production costs and the time it takes to create each piece.

The key to success for the Peninsula company is the technology used. Jake uses CNC machining to cut the wood to size which dramatically reduces labour costs and also minimises waste. The timber panels are CNC machined externally and then delivered to his small factory. Jake has built jigs to assemble his products in batches. One of his items, The Bedside, would normally have taken 15 hours to build, now only takes a bit over one hour of labour.

Peninsula design is focused on creating products with the environment in mind. Jake hates seeing furniture go to waste and does not agree with "fast furniture' that does not stand the test of time. "We're tired of living in a throwaway society, we also want to design furniture that people want to keep and that won't end up in landfill."

https://peninsulahome.co/pages/about


Equity
Personal values
Individual Needs
Cultural Beliefs
Community Needs
Safety and Health
Sustainability

Barangaroo development - Sydney

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iPhone


iPhone
at Energy Net
by Christian Daum
3G
9:41 AM
Messages
Calendar
Monday
7
Photos
Camera
YouTube
Stocks
Maps
280
Weather
73°
Notes
Utilities
iTunes
App Store
Settings
Phone
Mail
Safari
iPod

Community Playground

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Female long sleeved swimwear.

Hills Hoist

Take FOUR: Creativity

1. Complete the questions in the four squares individually.

2. Move to your allocated corner to discuss that particular question with your group. Record the groups ideas.

3. Move to the next corner and repeat till you have discussed all FOUR issues.

Describe a strategy you use currently in your classroom to promote creativity:	***Do you integrate technology when focusing on creativity? If so, how, and if not, why not?***
What challenges have you faced when trying to encourage creativity in your class?	***How do you assess creativity?***

Take FOUR:

1. Complete the questions in the four squares individually.

2. Move to your allocated corner to discuss that particular question with your group. Record the group's ideas.

3. Move to the next corner and repeat till you have discussed all FOUR issues.

Session 3:

Projects and portfolios

Project Ideas: Where do I start?

Coming up with suitable project ideas can be quite daunting. Here are a few things you could consider:

- What skills do you want them to learn?
- What resources/facilities do you have available?
- How big/small is your class?
- What are their capabilities?
- Access to Technology/ online tools.
- Feedback from previous tasks.
- Timing/Rooming restrictions

This Photo by Unknown Author is

- ✓ ***Learn new practical skills***
- ✓ ***Become confident in experimentation***
- ✓ ***Use a range of communication tools to succinctly convey their message***
- ✓ ***Become familiar with the structure of the portfolio***
- ✓ ***Evaluate, Evaluate, Evaluate!***

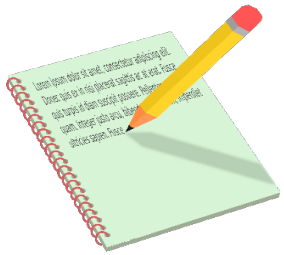
Project Ideas

Architectural Design: Eco design Design cabin self contain off the grid choose location, justify design.	Advertising Campaign: In design groups of three, choose a charitable group/ organisation. Design an event/ day to promote your chosen charity.	Illuminate: Design and produce a product, system or environment that represents the word ILLUMINATE.	Mini design project: Follow the stages of the design process and the principles of design thinking to develop a working prototype for a specific user living in a developing nation.	Divided Design: Design and produce a room divider which emphasises a particular design style or design era.
Pallet Project: *Design brief:* Design and produce a product using a timber pallet and scrap timber from the school workshop.	Puzzle Project: Design and produce a wooden/3D printed puzzle with all pieces made to zero tolerances. You will also need to create a sustainable packaging solution for the puzzle. The packaging of the product could be done in design teams.			

Session 4

EXAM TIPS

Verbs of the Week!



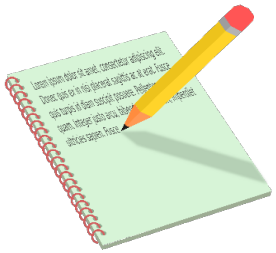
Verb of the Week!

Account

Account for: state reasons for, report on, give an account of narrate a series of events or transactions.

OUTCOME P1.1 QUESTION: Account for the rise in built in obsolescence in electronic appliances.

Identify and expand on each point.



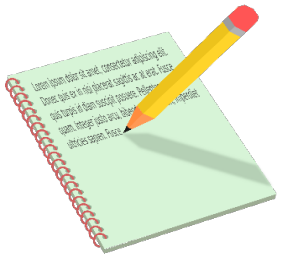
Verb of the Week!

Analyse

Identify components and the relationship among them

OUTCOME P1.1 QUESTION: Analyse the advantages of an interaction and overlap of design professions.

Describe each component	Identify the relationship between the components.
Component 1	
Component 2	
Component 3	



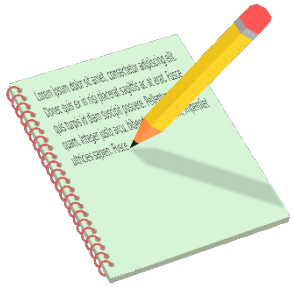
Verb of the Week!

Assess

Make a judgement of value, quality, outcomes, result or size.

OUTCOME P2.2 QUESTION: Assess the impact safety and health and community needs have on the design of a children's playground.

Focus	Advantages	Disadvantages	Judgement / Stance
Community needs			
Safety and heath			



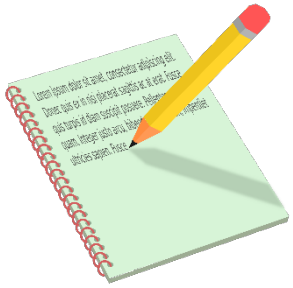
Verb of the Week!

Compare

Show how things are similar or different.

OUTCOME P2.1 QUESTION: Compare the production processes used in a domestic setting compared to those used in an industrial setting.

Describe each production process. It may be helpful to use a product as an example.	
Similarities	Differences



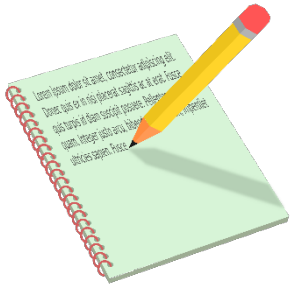
Verb of the Week!

Define

State meaning and identify essential qualities.

OUTCOME P5.1 QUESTION: Define the purpose of project management.

Meaning	Essential qualities



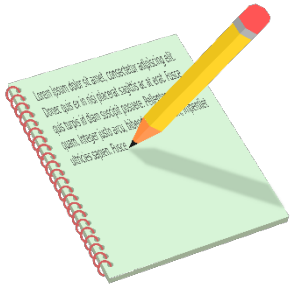
Verb of the Week!

Describe

Provide characteristics and features.

OUTCOME P4.2 QUESTION: Describe the role of Work Cover as a statutory authority.

Characteristics- *a quality or feature of something or someone that is typical of them and easy to recognise*	*Features-* *a part of something that you notice because it seems important, interesting, or typical*



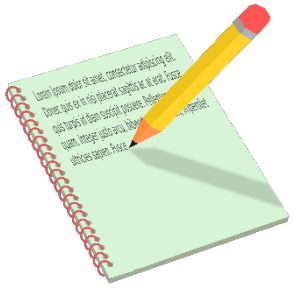
Verb of the Week!

Discuss

Identify issues and provide points for and /or against

OUTCOME P3.1 QUESTION: *Working collaboratively is vital when designing and producing.* Discuss this statement, providing specific examples.

	Issues	*Examples*
Points for:		
Points against:		



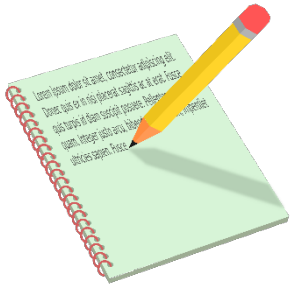
Verb of the Week!

Evaluate

Make a judgement based on criteria; determine the value of.

OUTCOME P6.2 QUESTION: ***Evaluate TWO computer-based technologies that could be applied when communicating design ideas.***

Describe the issue/topic.	Advantages	Disadvantages	Criteria	Judgement using the criteria



Verb of the Week!

Explain

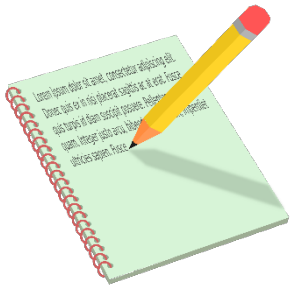
Relate cause and effect; make the relationships between things evident; provide why and/or how.

OUTCOME P5.3 QUESTION: ***Explain why it is necessary to use a variety of research methods when developing design projects.***

Identify Cause	*Identify Effect*	*Why/How*

OR

Describe the relationship between elements	*Why or how*



Verb of the Week!

Identify

Recognise and name.

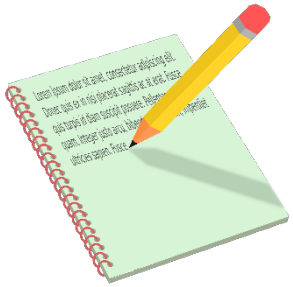
OUTCOME P4.1 QUESTIONS:

Identify FOUR ways to gather data for market research:

-
-
-
-

Identify FOUR common parameters designers face when completing a design project.

-
-
-
-



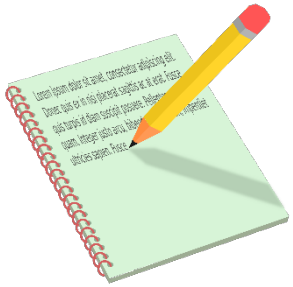
Verb of the Week!

Investigate

Plan, inquire into and draw conclusions about.

OUTCOME P5.2 QUESTION: ***Investigate the most appropriate methods interior designers use to communicate their design ideas to a client.***

Areas to research	References	Findings



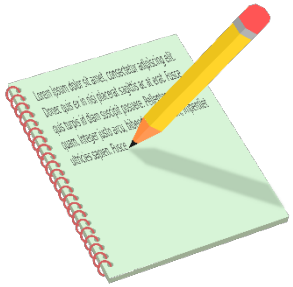
Verb of the Week!

Justify

Support an argument or conclusion.

OUTCOME P5.2 QUESTION: ***Justify the manufacturing processes you have used in your last project.***

Argument/points of view on the topic	***Evidence to support your argument/point of view. (Examples!)***

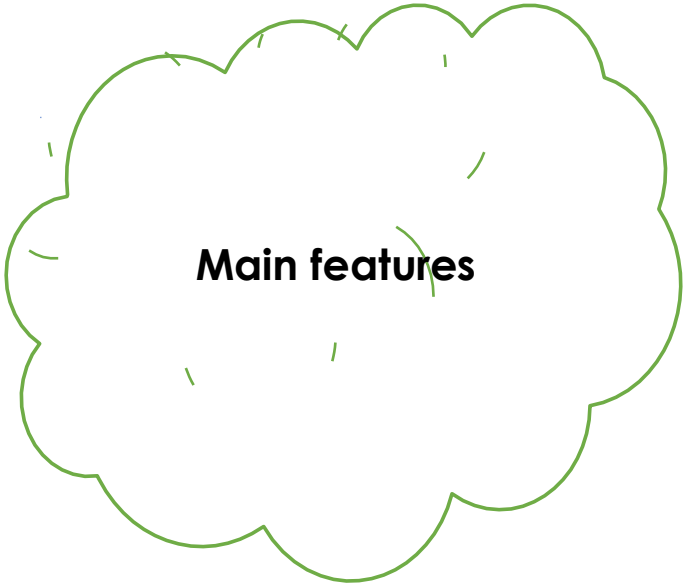


Verb of the Week!

Outline

Sketch in general terms; indicate the main features of

OUTCOME P1.1 QUESTION: Outline how a designer considers the appropriateness of a solution when designing and producing.



Sample questions to assist students in focusing on different verbs.

Account	• Account for the rise in sustainable practices amongst contemporary designers.
Analyse	• Analyse the processes you follow when designing and producing to ensure appropriate quality of your final product.
Assess	• Assess the advantages of working collaboratively.
Compare	• Compare the design processes of two designers from different design fields.
Define	• Define the term plagiarism and explain how it might impact on research.
Describe	• Describe a cognitive organizer you have used. Explain how cognitive organisers are used to assist the creativity of a designer. • Describe THREE research methods a designer could use as part of the design process
Discuss	• Discuss the importance safe work practices when designing and producing for both the designer and the consumer.
Evaluate	• Evaluate how designers can have both positive and negative impacts on Australian society. • Choose a designer you have studied. Identify ways in which the designer can generate and organise their ideas. Evaluate their effectiveness in the design process. Support your answer with specific examples.
Explain	• Explain the importance of conducting research into a range of manufacturing process prior to the PSE's final development. • "Consumers choose products not just for what they do, but for what they tell the world about them" Using a real example explain what this statement means.
Identify	• Identify the different management styles used in large organisations compared to the styles used in small organisations.
Investigate	• Investigate the process of Computer Aided Manufacturing (CAM).
Justify	• Justify why evaluation is necessary throughout the design process.
Outline	• Outline the differences between *qualitative research* and *quantitative research*.

Got it!

Identify THREE key concepts from today's lesson:

- ✓
- ✓
- ✓

Please explain

Identify the areas/concepts that you need more clarification on:

- ➢
- ➢
- ➢

Got it!

Identify THREE key concepts from today's lesson:

- ✓
- ✓
- ✓

Please explain

Identify the areas/concepts that you need more clarification on:

- ➢
- ➢
- ➢

Got it!

Identify THREE key concepts from today's lesson:

- ✓
- ✓
- ✓

Please explain

Identify the areas/concepts that you need more clarification on:

- ➢
- ➢
- ➢

Got it!

Identify THREE key concepts from today's lesson:

- ✓
- ✓
- ✓

Please explain

Identify the areas/concepts that you need more clarification on:

- ➢
- ➢
- ➢

Year 11

Design and Technology

Homework book

Name: _____

Homework Book

Year 11,

In this homework book, you will complete a range of questions from each of the three units we will complete this year. This will be valuable practice for writing a response. When completing these you will need to do the following:

- Complete the scaffold for that particular verb
- Box the verb
- Highlight the link to the syllabus
- Use a variety of metalanguage in your response
- Try to stay in the lines given

This book needs to be handed in every **Thursday**. You will receive a new question the following **Monday**. That means you have **THREE** nights to complete your homework. Plan your time so that you set aside no more than 15-20mins to complete the question. This should be completed EVERY week. By doing this you are setting yourself up for a very successful HSC.

Homework Book

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Useful Articles

Keep track of useful articles that can be used to present examples in exam responses.

Design Theory and design processes	
Factors affecting Design	
Design and production settings	
Environmental and social issues	

Creative approaches	
Market research	
Use of resources and safety	
Evaluation	
Management tools and techniques	

Communicating ideas	
Research methods	
Manufacturing and production processes	
Computer-based technologies	

Year 11 unit 1 Revision Quiz

1. What is “good design”? Give an example of a PSE with good design.

2. What tools can be used to encourage creative thinking?

3. What is the purpose of cognitive organisers? Give an example of where you have used a cognitive organiser.

4. What is the purpose of acknowledging what your limitations are when completing a project?

5. Why are two heads better than one? Discuss the benefits of working in a collaborative environment.

6. How do we produce better products when applying a variety of research methods? Give specific examples

7. Describe the two types of research.

8. What problems might you encounter when conducting a survey as a student?

9. Describe one type of collaborative management method.

10. Identify ONE positive and ONE negative aspects of the pyramid vertical management structure.

11. List FOUR things you should consider when selecting materials:

12. What is the role of WorkCover?

Extended response:

13. Safety is important in all aspects of our lives. As designers we must treat safety as crucial to the development of our designs. Identify various ways in which a designer can address the issue of safety.
(Please answer on separate writing paper)

Links

Design theory and processes	• Design Process https://www.tes.com/blog/iterative-design-a-process-we-always-should-have-used-what-happens-when-you-compromise-quality?fbclid=IwAR0u0uo1gIZ3Mekcx47GvYBGSs37f50t5TUH2GCynhP3RaBD0w7JwwxCxrE • Design process Let's stop talking about THE design process - Stanford d.school - Medium • Decoding Designer's Inspiration Process on Vimeo • Lessons from designers https://www.youtube.com/watch?v=smqfeBIMMqY&fbclid=IwAR0JG0o2WnpSbxUv4-So9qtrO-bI8KVZkMJpdrz52FHa-RVvNQg0NfvLL2o • https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process
Factors affecting Design	• https://www.theage.com.au/technology/apple-airpods-poor-design-hurts-our-wallets-and-the-environment-20191010-p52zj9.html?fbclid=IwAR0i7Uu9E1kY61402t4XN7JSf1hvDvPArtKMU048dPwrPVZo2677UdPQ5kE • Doing better with less https://www.youtube.com/watch?v=0jEj5cTJzZ0
Creative approaches	• https://vimeo.com/157359350?fbclid=IwAR3QXLDKgX6GtursN65xmaqIm6O01q5KqG7k5D-3CXpjMjgN5qHlqniG26M • Tim Brown: Designers -- think big! | TED Talk • Graphic organisers • Life hacks; passing fad or a valuable opportunity to develop problem solving skills in D&T? | Tes •
Communication	• Developing design ideas quickly https://www.youtube.com/watch?v=7FNbWCjihy0&feature=youtu.be&fbclid=IwAR0wdSs5TQEcb5NqI-RXDUNmGmHcMN0zQ1SXyyhFof6IJknlwqv1yR_ok6Y • Product Design sketching https://www.youtube.com/watch?v=71r8nG3Udv8
Management	• https://www.interaction-design.org/literature/article/design-management-an-introduction-taking-charge-of-processes-and-people
Research methods / Marketing	• Starbucks SWOT Analysis - YouTube •
Computer based technologies	• Ford's use of 3D printing https://ultimaker.com/learn/ford-reinventing-efficient-manufacturing-using-3d-printing
Manufacturing processes	• https://www.architecturendesign.net/engineer-invents-shelters-for-the-homeless/?fbclid=IwAR29dQlDW7R6S2a3kfYTcmg9ytqDGAvyxCD8szhwpjHZ8D6m2MMXBWXUz34

Environmental and social issues	• William McDonough: Cradle to cradle design | TED Talk • Sustainable designer example https://peninsulahome.co/pages/about • Impact of 3D printing https://www.fabbaloo.com/blog/2017/12/12/what-are-the-environmental-impacts-of-3d-printing
Safe use of resources	• Life cycle analysis https://www.youtube.com/watch?time_continue=72&v=01tF21O2iso •

Higher School Certificate Examination

PRELIMINARY EXAMINATION

Semester 1

Design and Technology

General Instructions	**Total marks – 40**
• Reading time – 5 minutes • Working time – 1 ½ hours • Write using black or blue pen Black pen is preferred • Write your Student Number at the top of each page	Section I Pages 2–4 10 marks • Attempt Questions 1–10 • Allow about 15 minutes for this section Section II Pages 5–7 25 marks • Attempt Questions 11 • Allow about 45 minutes for this section Section III Page 8 – 10 15 marks • Attempt Question 12 and Question 13 • Allow about 30 minutes for this section

Section I - 10 marks

Attempt Questions 1–10

Allow about 15 minutes for this section

Use the multiple-choice answer sheet for Questions 1–10.

1. Sustainable design practices aim to reduce which of the following?

(A) Cost

(B) Time

(C) Efficiency

(D) Environmental impact

2. When developing a new product, which if the following clearly defines the aims and intentions of the product?

(A) Design brief

(B) Design process

(C) Design situation

(D) Design specification

3. Evaluation is a key stage of the design process and should occur

(A) At the beginning of the design process

(B) After experimenting to select resources

(C) At the end of the design process

(D) Throughout the entire design process

4. When is a design solution considered to be most appropriate?

(A) When it satisfies the aesthetic requirements

(B) When it meets the needs of the target market

(C) When it provides strength, durability and safety

(D) When it fulfils its intended end use requirements

5. When we distinguish between domestic, community, industrial and commercial setting we are most likely to consider the

(A) Scale of production, manufacturing techniques and plant size

(B) Number of workers, scale of production

(C) Plant size, geographical position and government funding

(D) Management structures, manufacturing techniques and number of workers

6. Which criteria would be most important when designing a new school uniform?

(A) Safety, ergonomics and aesthetics

(B) Function, ergonomics and safety

(C) Aesthetics, function and durability

(D) Recyclability, safety and function

7. The process of analysing a product from its conception through to its disposal is

(A) Quality control

(B) Lifecycle analysis

(C) Environmental analysis

(D) Ongoing evaluation

8. Which of the following is the main role of *Workplace Health and Safety* committees?

(A) To ensure the worksite is safe and healthy

(B) To check that all danger areas are clearly marked

(C) To deliver orientation sessions for all new employees

(D) To ensure that injured staff receive compensation

9. Which of the following is important for designers to consider when communicating their ideas to potential clients?

(A) Communicate the ideas clearly and concisely

(B) Use graphics as well as text when presenting ideas to large groups

(C) Consider the audience when deciding which communication method to use.

(D) Understand the needs of the target market and change the design accordingly.

10. The most important factor to consider when designing children's play equipment is

(A) Safety standards

(B) ergonomics

(C) aesthetics

(D) cost and availability of resources

Section II - 15 marks

Attempt Questions 11. Allow about 35 minutes for this section

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 11 (10 marks)

Sally Dominguez designed the Nest Highchair after the birth of her first child. Rotation moulding technology was used in the construction and the chair has a scooped out plastic seat and detachable tray. The column and tray can be removed to allow the chair height to be adjusted, forming a low chair for older children.

a) Identify the need, problem or opportunity Sally Dominguez may have been responding to when she designed the Nest Highchair. **1 mark**

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b) Identify two criteria which could be used to evaluate the success of the Nest Highchair.

2 marks

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c) Describe a target market for the Nest Highchair. **2marks**

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d) Using the table below to assess the aesthetic and functional qualities of the Nest Highchair. **4 marks**

	Qualities
Function	
Aesthetics	

e) Define the following factors affecting design. Analyse how each would impact on the design of the Nest Highchair. **6 marks**

Ergonomics

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Use of design

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Health and safety

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Section III- 15 marks

Allow about 40 minutes for this section

Answer the question in a writing booklet. Extra writing booklets are available.

Question 12

a) Describe the tools that can be used to encourage creative thinking. **2 marks**

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b) How does the selection of presentation techniques influence the communication of a design idea to a client? **3 marks**

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Question 13

a) Define the term collaborative design. Discuss the benefits of working in a collaborative environment. Provide examples. **5 marks**

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b) Identify TWO design periods that you have studied this term. Analyse the key differences between each of those design periods. Making reference to the key features and influences of each era. **5 marks**

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