EMDD: **E**NTREPRENEURSHIP **M**INDSET &
DESIGN USING **D**IGITAL TOOLS

LEARNING GAME DESIGN

Unit 9-3

Delhi Board of School Education

What Will I learn & practice?

In the previous unit students engaged in creating a game design document where they planned different aspects of what makes a game interesting and brainstormed on different ideas that can be implemented to create a learning game. In this unit, students will learn how to create a solution by designing the learning a game they planned to design and evaluate it through the unit. The choice of the platform is preferred to be scratch but students can choose a platform of their choice too.

Entrepreneur Mindset

Bounce-back from Failure

Persevere

Real-life Knowledge

Essential Game Elements

What makes a Great Learning Game?

Design Thinking

(see assessment rubric at the end of the unit)

C. Create Solution

D: Evaluate

Digital Tools

Block Programming Tool (Scratch or similar)

Documentation - Blog or Slides

Foundational Abilities & Key Qualities

Communication, Critical thinking, Reflection

Creativity, Joyfulness, Manage fears

Unit 9-3 Section A: Orientation to the Unit

9-3 A0

BOUNCE BACK FROM FAILURES

SUGGESTED TIME
30–40 MINUTES

Objective

By completing this activity, students will be able to:

+ Infer how staying resolute and learning from failures is basis for success.

CONTEXT

- ❑ Do you know what an Antivirus is?
- ❑ Name a few Antivirus softwares available in the market.
- ❑ Antivirus is a type of software that prevents, detects, and removes malware from the computer. Quick Heal is one such Antivirus software developed in India.

RESOURCES

- ❑ Refer Pg 2 for story
- ❑ Refer Pg 3 for summarizing worksheet
- ❑ Article
  Quick Heal Story

REFLECTION PROMPTS

+ How would Sanjay and Kailash have got the strength and courage amidst several obstacles?
+ What would have happened if Kailash and Sanjay had quit in disappointment?
+ What challenges did you face in your life in the past? What was your source of strength and inspiration to overcome these obstacles?

ACTIVITY DESCRIPTION

+ Read the story of Quick heal(Pg 2)
+ Assign one part to each student in your group for summarizing(Pg 3)
  1. The setting of the story, characters.
  2. Beginning of the story
  3. Middle of the story
  4. End of the story
+ After summarizing, answer to the reflection prompts given.

CONSOLIDATION

The story of Sanjay Katkar and his brother Kailash Katkar, who developed Quick Heal antivirus inspires us to believe in our efforts firmly and never to quit. If we quit in fear due to initial setbacks, failure is inevitable; however, if we keep on trying and working hard, the likelihood of success increases manifolds.

HOME TASK

Look back at your life and reflect back on a moment when you were able to be resilient through challenges and make a note of it.

STORY

<1>

Two brothers, Kailash Katkar and Sanjay Katkar, lived in Pune in a 10'x12' room with their parents and younger sister. Their father used to repair machines after office hours to be able to pay for the education of his three children. Due to the poor financial condition, the elder brother Kailash left his studies and began repairing radios at home. Later, he opened his repairing workshop and also started taking up jobs from banks like repairing laser printing machines. However, his younger brother wanted to become an engineer, so he took admission in a computer science course.

<2>

During this period, India saw a surge in computer users and along with it came the need to frequently repair them. At that time, there was no Internet, so the virus that used to affect computers originated from floppy disks. Once the computer got affected by the virus, it could no longer stay operable. Sanjay was very curious to know more about the virus and craved to explore more about the subject. He started to spend a lot of time in Kailash's repair workshop to understand computer viruses in detail. He performed experiments with computers, and after a lot of hard work and experience, he managed to develop a software that could remove the virus from the computers. He installed this antivirus software in his college's computer lab and removed the virus from those computers.

After getting a Master's degree, Sanjay applied for work in various companies. However, his elder brother suggested they work together. So, instead of working for a big company with a hefty salary or opting to move abroad, without any hesitation, Sanjay started a company in 1995 together with his elder brother Kailash.

<3>

The path they walked on initially proved to be the hard one. People could not understand the importance of Antivirus software in India. Moreover, Indian sellers only wanted to sell foreign products. As a result of which Sanjay and Kailash could only sell one or two of their Quick Heal antivirus software packs. Hence, they started to distribute it for free to gain some publicity. The business did not grow, as expected, even after two years. However, the experience they gained through the hardships of their childhood struggles came to their rescue during such challenging times. They knew very well that the problem of the virus would increase as the technology spread; hence, they believed that demand for their antivirus software would also rise. They believed in themselves and kept on working hard. Due to the surge in Internet usage, new types of virus emerged. Quick Heal already had the solution for the virus; hence its demand increased, and finally, their business took off. They effectively closed down their repair workshop in 1998 and got fully involved in producing and selling antivirus software.

In 1999 the company faced financial challenges. It was difficult for Sanjay and Kailash even to pay salaries to their employees. They needed a software engineer, but it was not easy to find a suitable candidate as everyone wanted to work abroad with a handsome salary.

<4>

Despite facing such a difficult situation, they did not give up. They evaluated their situation calmly. They realized that customers valued Quick Heal more compared to the products developed by MNCs. Now, they had to pay close attention towards building their brand internationally, while simultaneously focusing on developing an automation technique to enhance antivirus production with minimum human involvement. Sanjay continued producing many new antivirus softwares using this automation technique. They struggled for five years but ultimately earned international recognition and developed a positive image in the market. Quick Heal grew even bigger as an international brand along with their national business. They managed to instill confidence in the Indian customers that even the domestically made, less expensive antivirus software can perform better than its foreign counterparts. They gradually expanded their business, and in 2010 they began their operations abroad as well. Their business has 1000 employees with a turnover of 400 crores. Now, Quick Heal is no longer just a company that develops antivirus software, but it has grown into a complete cybersecurity solutions company.

SUMMARY

Setting

Where is the story taking place?	Who is it about?

Beginning

Middle

End

9-3 A1

DESIGN JOURNAL

SUGGESTED TIME
30–40 MINUTES

Objective:
By completing this activity, students will be able to:
+ Identify prominence of a design journal for documenting the design process and reflections.

CONTEXT

❑ A design journal is a physical or digital **notebook** where you can **brainstorm ideas** and **share reflections,** similar to a personal journal or diary. You will be given reflection questions to update your design journals throughout the unit and encourage you to add to your journals anytime during the process of designing learning game to capture ideas, inspiration, notes, sketches, questions, frustrations, triumphs, etc.

ACTIVITY DESCRIPTION

+ Look through sample design journals to get ideas for what type of design journals (paper or digital) will work best for your students.
+ Take time to start and personalize your design journals.
+ Create your first design journal post by responding to the reflection questions on the right.

RESOURCES

❑ sample design journals
http://bit.ly/designjournal-paper(Photo of design)
http://bit.ly/design-journal-digital
http://bit.ly/designjournal-blog
❑ paper and craft materials (for paper journals)

REFLECTION QUESTIONS

+ How would you describe Scratch to a friend?
+ Write or sketch your experience in creating a sample games on scratch.

CONSOLIDATION

Through the design journey process there might be ideas that might stem from reflections and learning new skills, if this process is documented it would aid in creating and evaluation of the design.

HOME TASK

Write reflections for the day in your design journal and share in the classroom.

9-3 A2

Reinforce joyfulness in learning through games

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will:

+ justify the need to gamify a learning experience.

CONTEXT

- ❑ Do you like playing games or quizzes?
- ❑ Why does it bring joy in learning?

Quizzes have a score which will help us to gauge where we are pushing us to do better. As we gain points with the knowledge we have it makes us feel good to know something.

ACTIVITY DESCRIPTION

Watch the video to learn math while playing games.

Once done watching the video answer below questions:
-Why did the student want to hide from the teacher?
-What role did the animals play in the game design?
-When do you see students participating in class?

RESOURCES

- ❑ Youtube
  Learn Math While Playing Games

REFLECTION PROMPTS

<to be answered in design journal>

+ Can complex topics be learnt through games?
+ Will students focus on learning or playing the game?
+ According to you, which element of the game design aids most in learning?

CONSOLIDATION

The games in learning helps in **student participation** and **active engagement,** it not only brings joy in learning but also enhances learning outcomes. It also motivates students to take risks by playing different levels.

HOME TASK

The games in learning helps in student participation and active engagement, it not only brings joy in learning but also enhances learning outcomes. It also motivates students to take risks by playing different levels.

9-3 A3

Step-by-step - Sequencing

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will:

+ learn to express a complex activity using a sequence of simple instructions

CONTEXT

- ❑ Working on game design using technical skills doesn't have to be complicated.
- ❑ Computers enable you to not only work on technical skills but also creativity through simple steps.
- ❑ Let us look at a simple activity that we do in our daily life and see how the instructions can help in designing a machine to make the process

RESOURCES

- ❑ Youtube(2 mins)
  Roti Maker

ACTIVITY DESCRIPTION

1. List down the instructions to make a roti at home.
2. Next, watch the video of a roti maker.
3. List down the steps done by the roti maker.
4. Then answer the reflection questions in design journal.

REFLECTION PROMPTS

<to be answered in design journal>

+ What are the differences in instructions you have written and that followed by roti maker?
+ Which is better way to make a roti?
+ How is this activity related to Scratch? Can you relate?

CONSOLIDATION

This activity forms the basis for you to understand the prominence of instructions that we use in designing learning games.

HOME TASK

Write the instructions that you would list down to design a machine that would automate any household chore like that of roti maker.

Unit 9-3 Section B: Learn relevant technical skills and Create action plan

EXTENSIONS

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will be able to:

+ develop technical skills and explore different extensions that can be added to games.

CONTEXT

- ❑ For an artist to create a beautiful painting, what enables them?
- ❑ What would be the prerequisite to it?

(The skills of making strokes in painting.)

- ❑ Before developing the game design we will need technical skills to create the solution, in the next 2 classes we will get to learn about different extensions that can be added as part of their learning game.

ACTIVITY DESCRIPTION

+ Go to the Extensions studio: http://scratch.mit.edu/studios/475619
+ Choose one (or more) of the extensions to explore.
+ Include your choice into your previously planned learning game design.

RESOURCES

Refer Pg 2

REFLECTION PROMPTS

<to be answered in design journal>

+ What are different ways of increasing difficulty in a game?
+ Which extensions did you add to your game project?
+ Describe your process for including the extension(s) in your game?

CONSOLIDATION

Now that you have learnt about different extensions - you will use the relevant extension as part of the learning game.

HOME TASK

Explore one other extension of your choice.

EXTENSIONS

Get into game design by adding extended features within your Scratch project! Choose at least one (or more!) of the following extensions and add it to your previously started learning game.

SUGGESTED TIME
30–45 MINUTES

HOW CAN YOU EXTEND AND REIMAGINE GAMES IN SCRATCH?

START HERE

- ❑ Go to the Extensions studio: http://scratch.mit.edu/studios/475619
- ❑ Choose one (or more) of the extensions to explore.
- ❑ Incorporate your choice into your previously started game projects!

+ **LEVELS** http://scratch.mit.edu/projects/1940453
Demonstrates how to change levels. Score increases by 1 every time the space bar is pressed. Level increases by 1 for every 10 points.

+ **TIMER** http://scratch.mit.edu/projects/1940445
Demonstrates how to use a timer. Use the mouse to navigate the Scratch cat to Gobo.

+ **ENEMIES** http://scratch.mit.edu/projects/1940450
Demonstrates how to add an enemy. Avoid the tennis ball by using the up and down arrow keys.

+ **REWARDS** http://scratch.mit.edu/projects/1940456
Demonstrates how to collect items. Use the arrow keys to move the Scratch cat around to collect quest items.

+ **MOUSE** http://scratch.mit.edu/projects/25192659
Demonstrates how to program the mouse to control game play. Move the mouse to move the paddle.

+ **SCORE** http://scratch.mit.edu/projects/1940443
Demonstrates how to set and change a score. Receive 10 points every time the Scratch cat is clicked.

+ **RESTART** http://scratch.mit.edu/projects/25192935
Demonstrates how to make a button to restart the game. Click on the RESTART button to restart.

+ **MENU** http://scratch.mit.edu/projects/25192991
Demonstrates how to display a menu screen at the beginning of the game. Click START or DIRECTIONS on the menu screen.

+ **MULTIPLAYER** http://scratch.mit.edu/projects/25192711
Demonstrates how to add another player to the game. Player 1 uses the arrow keys to navigate Pico through the maze, and player 2 uses the W, A, S, D keys to navigate Nano through the maze.

9-3 B3

ACTION PLAN

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will be able to:

+ develop an outline of activities or tasks required to complete the tasks listed in game design document, and create an action plan.

CONTEXT

- ❑ Now that you have explored different technical skills it is finally time to implement your game design.
- ❑ To implement the game design plan - it is equally important to plan your actions(things that you need to do to implement the plan)
- ❑ What are the things you need to keep in mind before implementing a plan?
  For example: To add score to my learning game I need to learn or have the skill of adding score to game.
- ❑ What are the other things that you can think of?

ACTIVITY DESCRIPTION

+ In the game design document add three extra columns to allocate the tasks to different members of your team:

  1. **Sequence** the tasks: What is the most important task that you want to start with and then what would be the next?
  2. Who is going to take **ownership** of each task ?
  3. Pick any two components, What is the **time** you need to allot for the task?
  4. If this would be the **potential barrier f**or the picked tasks, what is the resource you would be required to complete the task?

RESOURCES

❑ Refer pg 2

REFLECTION PROMPTS

<to be answered in design journal>

+ What are the resources that you already have?
+ What are the resources that you might need?
+ Last unit you planned about how to create a game design, How do you think this action plan is different from it?

CONSOLIDATION

Action plans help us to be more action oriented focusing on the acting on the plan. With realising what are the resources you might need.

HOME TASK

Complete the action plan for other components of the game design document.

SAMPLE ACTION PLAN

GOAL: To make a learning game on associative property				
Strategies	**Learn what associative property**			
	Add interactive elements to the game			
SNo	**Sequence of the tasks -Action Description**	**Owner of the task**	**Time required**	**Potential barriors**
1	Character and background	Priyanka	6th Nov-8th Nov	Not finding the right resource
2	Send and receive messages			
3	Associative property background - Information			
4	Score			

Unit 9-3 Section C: Implement the action plan and identify challenges

9-3 C1

DESIGN TIME BOUND

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will be able to:

+ apply technical skills and practices to develop the learning game.

CONTEXT

- ❑ Time-bounded design is a specified amount of time dedicated to working intensely on developing projects.
- ❑ Write down goals for this session using the reflection prompts in their design teams or in their design journals.

RESOURCES

- ❑ Sample projects on Scratch

REFLECTION PROMPTS

<to be answered in design journal>

+ What part of your project did you work on today?
+ What might you need help with in order to make progress?

ACTIVITY DESCRIPTION

+ In the next 30 minutes you will work on the implementation of your game design.
+ You can refer to the game design document, action plan, technical skills you developed, and additional resources given as needed. In addition, you can take support from your peers.
+ Document the process in your respective design journals.

CONSOLIDATION

All design activities are constrained – by time, by resources, by our own abilities at a given moment – and compromises may need to be made. This session gives you the **opportunity to identify the most important aspects of your project.** What can reasonably be accomplished in the remaining time

HOME TASK

Try accomplishing the remaining aspects of the projects

9-3 C2

DEBUG IT

SUGGESTED TIME
30–40 MINUTES

CONTEXT

- ❑ What are the things that are not working in your design as planned?
- ❑ Once we give step by step instructions to the computer in the sequence - identifying instructions that are not resulting the intended outcome helps us find the problems in our design.

ACTIVITY DESCRIPTION

+ Make a list of possible bugs(problems) in the program you designed.
+ In your design journal, describe the challenges that you are facing.
+ Share the problem with the members in your group, the things you tried to fix the problem.

OBJECTIVE

By completing this activity, students will be able to:

+ investigate a problem and find a solution, while developing debugging strategies.

RESOURCES

- ❑ Learning game designed.

REFLECTION PROMPTS

<to be answered in design journal>

+ What was the problem?
+ How did you identify the problem?
+ How did you fix the problem?
+ Did others have alternative approaches to fixing the problem?

CONSOLIDATION

While creating a solution the tasks you might have planned might not result in the outcome and it is common people who create a solution. Things rarely work as planned, so developing identification strategies will be beneficial.

HOME TASK

Work on finding a solution for one of the problems listed in your game design.

9-3 C3

PROJECT FEEDBACK

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will be able to:

+ critique their project to give each other preliminary feedback in the group.

CONTEXT

- ❑ As you worked on designing the game and identifying the challenges in the design, the next step would be to review the project within the group before sharing it with the target audience.
- ❑ In this session, you will categorize the different elements into 3 different categories based on the feedback questions.

ACTIVITY DESCRIPTION

+ In the next 15 minutes review your project and critique the project draft .
+ Refer handout to answer the Red, Yellow, Green feedback questions.

  Red - What is something that doesn't work or could be improved?
  Yellow - What is something that is confusing or could be done differently?
  Green - What is something that works well or you really like about the project?

RESOURCES

❑ Refer Pg 2

REFLECTION PROMPTS

<to be answered in design journal>

+ What aspects of your project could someone give you feedback about?
+ What feedback, if any, do you plan to incorporate into your project next?

CONSOLIDATION

Reviewing the progress of the project helps in providing different perspectives from different people.

HOME TASK

Add any other elements in the feedback handout that you identify.

PROJECT FEEDBACK

FEEDBACK FOR:

_____

PROJECT TITLE:

_____

RED, YELLOW, GREEN

FEEDBACK BY	[RED] STOP What is something that doesn't work or could be improved?	[YELLOW] START What is something that is confusing or could be done differently?	[GREEN] CONTINUE What is something that works well or you really like about the project?

PARTS OF THE PROJECT THAT MIGHT BE HELPFUL TO THINK ABOUT:

+ Clarity: Did you understand what the project is supposed to do?
+ Features: What features does the project have? Does the project work as expected?
+ Appeal: How engaging is the project? Is it interactive, original, sophisticated, funny, or interesting? How did you feel as you interacted with it?

Unit 9-3 Section D: Improvements and Expression

9-3 D1

Evaluation by target audience

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will be able to:

+ critique their project to give each other preliminary feedback in the group.

CONTEXT

- ❑ Recap the project in progress and the changes you made.
- ❑ How would the target audience(anyone from your class/school) feel about your project?
- ❑ Is it necessary to take feedback from them before you finalize the project?

The role of the target audience is crucial to see any challenges that weren't identified within the team as sometimes we don't know how the solution is being received and what might be the need of the target audience.

ACTIVITY DESCRIPTION

+ Choose your **target audience(In your classroom/school).**
+ Spend time to interview, observe, and record feedback from atleast two target audience.
+ Meet with your group members to share feedback collected from different target audience.

RESOURCES

- ❑ Refer Pg 2

REFLECTION PROMPTS

<to be answered in design journal>

+ How might the target audience's ideas influence your project?

CONSOLIDATION

One can be creative in getting feedback from different resources. It would help us in creating an effective solution.

HOME TASK

Incorporate the suggestions provided by the target audience

9-3 D1

Evaluation by target audience

PROJECT TITLE: _____
INTERVIEW BY: _____

In this activity, you will interview and observe others to get feedback on your project-in-progress.

OBSERVE

Share your project with your target audience and observe their reactions.

+ What are they getting stuck on?
+ Are they interacting with your learning game the way you imagined?
+ Are they doing anything surprising?

INTERVIEW

After you observe, interview your target audience about their experience.

+ What feedback did you receive from your interview?
+ What suggestions, if any, do you plan to incorporate into your project next?

9-3 D2

Success of solution and Reflection on the design process

SUGGESTED TIME
30–40 MINUTES

OBJECTIVE

By completing this activity, students will be able to:

+ evaluate the success of the solution by justifying the changes made to the plan.

CONTEXT

- ❑ Did you make any changes to the learning game design?
- ❑ Why did you make changes?

Improvement is a continuous part of any creation and design process. It is important because it's the best way to ensure that we're doing things in the most efficient, effective, and productive way, every single day of our project, and on every single component that we're working on.

ACTIVITY DESCRIPTION

+ Make a final list of improvements after the feedback from target audience and make the changes in your design.
+ Review the changes again and look for any other possible improvements that can be made.
+ Describe the success of the project in achieving the desired learning outcome.

RESOURCES

- ❑ Refer to the design journal for the design process of where you started, concepts you learnt and changes you made.

REFLECTION PROMPTS

<to be answered in design journal>

+ Do you think this activity was helpful ?
+ Is there scope for more improvements in your learning game design?
+ Explain how successful your solution is.

CONSOLIDATION

Whenever we approach an idea, there are always small improvements that can be made. For instance, in a learning game, maybe you can add more characters, objects, fun elements etc. to make it more engaging and fun. The idea is to always think about the target audience who will be benefiting from your learning game. Keeping them in mind, you can decide what's best for your learning game and change it accordingly.

HOME TASK

Incorporate the suggestions provided by the target Fianlize the learning game design and practice on how to present it.

Unit 9-3 Section E: Presentation and Assessment

9-3 E1

Guidelines for Presenting Your Work in Unit 9-3

As you and your group prepares for presentation of your work in unit 9-3, please ensure that the topics mentioned below are adequately covered.

Topics to Include in Your Presentation

1. Detailed action plan using diagrams and text.
2. Description of game development platform's features that you found useful while implementing your game.
3. Sharing with Peers: Who tested and what peer feedback was received.
4. Changes made to the action plan while implementing your game. Explain and justify why.
5. Process of evaluating the success of your learning game
6. Points on which your learning game was successful considering the items in game design document.
7. Reactions and comments you received from your target group.
8. Details of what improvements are desired in the learning game.

Unit 9-3

Assessment Rubric

NOTE: Unit Assessment is based on how well you follow specified design cycle objectives during the entire unit. You will be asked to write your experiences in response to the questions asked at the end of the unit.

Rubrics specific to each Criterion Strand

Criterion	Strand	Score 0	Score 1-2	Score 3-4	Score 5-6	Score 7-8
C. Creating Solution	**i.** construct a logical plan, which outlines the efficient use of time and resources, sufficient for peers to be able to follow to create the solution	None of the descriptors apply	**partially outlines** each step in a **plan** that contains **some details**, resulting in **peers not able to understand the plan** to create the solution	**outlines** each step in a **plan** that contains **some details**, resulting in **peers having difficulty following the plan** to create the solution	**constructs** a **plan**, which **considers time and resources, sufficient for peers to be able to follow** to create the solution	**constructs** a **logical plan**, which outlines the **efficient use of time and resources, sufficient for peers to be able to follow** to create the solution
C. Creating Solution	**ii.** demonstrate excellent technical skills when making the solution	None of the descriptors apply	demonstrates **minimal technical skills** when making the solution	demonstrates **satisfactory technical skills** when making the solution	demonstrates **competent technical skills** when making the solution	demonstrates **excellent technical skills** when making the solution
C. Creating Solution	**iii**. follow the plan to create the solution, which functions as intended **v**. present the solution as a whole	None of the descriptors apply	creates the **solution**, which **functions poorly** and is **presented in an incomplete form**.	creates the **solution**, which **partially functions** and is **adequately presented**	creates the **solution**, which **functions as intended** and is **presented appropriately**	**follows the plan** to create the **solution**, which **functions as intended** and is **presented appropriately**
C. Creating Solution	**iv**. explain changes made to the chosen design and the plan when making the solution.	None of the descriptors apply	**attempts to outline changes** made to the chosen design or plan when making the solution, **but is not able to**	**partially outlines changes** made to the chosen design or plan when making the solution.	**outlines changes** made to the chosen design and plan when making the solution.	**explains changes** made to the chosen design and plan when making the solution.
D. Evaluating	**i**. describe detailed and relevant testing methods, which generate accurate data, to measure the success of the solution	None of the descriptors apply	**describes any testing method**, which is used to measure the success of the solution	**describes one relevant testing method, which generates data**, to measure the success of the solution	**describes several relevant testing methods, which generate data**, to measure the success of the solution	**describes several detailed and relevant testing methods, which generate accurate data**, to measure the success of the solution
D. Evaluating	**ii**. explain the success of the solution against the design specification	None of the descriptors apply	**states the success** of the solution.	**outlines the success** of the solution against the design specification based on relevant product testing	**describes the success** of the solution against the design specification based on relevant product testing	**explains the success** of the solution against the design specification based on authentic product testing
D. Evaluating	**iii**. describe how the solution could be improved	None of the descriptors apply	**partially attempts** to **list some way** in which the **solution** could be **improved**	**lists the ways** in which the **solution** could be **improved**	**outlines how** the **solution** could be **improved**	**describes how** the **solution** could be **improved**
D. Evaluating	**iv**. describe the impact of the solution on the client/target audience.	None of the descriptors apply	**partially attempts** to **mention the impact** of the solution on the client/target audience	**outlines the impact** of the solution on the client/target audience.	**describes the impact** of the solution on the client/target audience, **with guidance.**	**describes the impact** of the solution on the client/target audience.