IB MYP Unit Planner

3D Bobble-Head Project

TEACHERS
Moneeb Minhas, Jonn Nicholson

SUBJECT
Design

SHARED GRADES
Grade 7

START DATE
Week 2, September

DURATION
16 weeks
30 hours

COURSE PART

INQUIRY

Key Concepts

Systems are sets of interacting or interdependent components. Systems provide structure and order in human, natural and built environments. Systems can be static or dynamic, simple or complex.

Related Concepts

Design

Innovation, Invention

Conceptual Understanding

Systems develop through form and function

Global Context & Explorations

Personal and cultural expression

Explorations to develop

- Craft
- Products

Statement of Inquiry

3D Printing Systems Allows for the Ability to Invent and Innovate to produce personal or cultural products.

Inquiry Questions

Factual Design	What is 3D printing?
Conceptual Design	How can we use CAD/CAM to design and make a Bobble-head figurine of high quality.
Factual Design	What is the process of 3D printing?
Conceptual Design	How can we use 3D printing to benefit society?
Debatable Design	To what extent can a 3D printer be used to manufacture products on a large scale?
Conceptual Design	How can we capture things in 3D to create models?
Debatable Design	Will 3D printing replace high store products in the future?

RESOURCES

OCT
4

1. Inquiry and Analysis - 3D Bobblehead Pen

Summative Task Thursday at 9:00 AM

Students to complete all tasks in the first section (Inquiry and Analysis) of their Google Portolfios.

Tasks to complete:

TASK 1A: Research About 3D printing

TASK 1B: Research 3D printing to solve problems

TASK 2A: Situation Analysis

TASK 2B: Situation Analysis

TASK 3A: Product Analysis

TASK 3b: Product Analysis

TASK 3c: Product Analysis

TASK 4: Justifying the need

TASK 5: Research (Theses are extra optional tasks for a Level 8)

TASK 6: Design Brief

You must click SUBMIT on Google Classrooms once you have completed all tasks above.

NOV
15

2. Developing Ideas - 3D Bobble Head Project

Summative Task Thursday at 9:00 AM

Students to complete the following Tasks:

TASKS

- Specification
- Moodboard
- Design Ideas Sheet 1 (with annotations)
- Design Ideas Sheet 2 (With Annotations)
- Presenting your final Design
- Reasons for selection and Requirements for creating your design

PLEASE NOTE: DO NOT complete Task 7 or 8 in this section

JAN
12

3. Creating the Solution - 3D Bobble-head project

Summative Task Saturday at 9:00 AM

Students to complete the following tasks:

TASKS
9 . Plan for making

10. Creating the solution (Body and 3D printed Head)

11. FINISHED PRODUCT

JAN
23

4. Evaluating - 3D Bobble-Head Project

Summative Task Wednesday at 9:00 AM

Evaluation

Tasks: Students to complete the evaluation tasks. Explanations are to be found in the portfolio.

MAR
10

1. Inquiry and Analysis - 3D Bobble-head Project

Summative Task Sunday at 9:00 AM

Students to complete the following tasks:

Task 1: 3D printing

Task 2A - 2C: Product analysis

Task 3: Design Brief

All explanations of tasks can be found in Google drives portfolio.

NOTE: YOU DO NOT NEED TO UPLOAD ANYTHING TO MANAGEBAC. INSTEAD DO ALL WORK ON THE GOOGLE DRIVES PORTFOLIO

MAR
31

2. Developing Ideas - 3D Bobble-head

Summative Task Sunday at 9:00 AM

Students to complete the following tasks:

Task 4: Design Specification

Task 5: Design Ideas x4

Task 6: Development of chosen design in 3D

Task 7: Orthographic Projection

Task 8: Capturing your face in 3D

Task 9: Final Design

APR
4

2. Developing Ideas - 3D Bobblehead Project

Summative Task Thursday at 9:00 AM

Students to complete the following tasks

1. Design Specification

2. Developing Ideas x2

3. Developing Ideas x2

4. Presenting your chosen design development

5. Reasons for selection and requirements

6. Head in Meshmixer

7. Orthographic drawing

MAY
16

3. Creating the Solution - 3D Bobblehead Project

Summative Task Thursday at 9:00 AM

Students to complete the Creation of the Pen in class using 3D printing and 3D modelling skills.

Students then need to display their finished project on their portfolios, showing 3 angles of photographs.

MAY
30

3. Creating the Solution - 3D Bobble-head Project

Summative Task Thursday at 9:00 AM

Students to complete the following tasks:

Task 10: Plan for Making

Task 11: Creating the Solution

JUN
20

4. Evaluating - 3D Bobble-head Project

Summative Task Thursday at 9:00 AM

Students to complete

Task 12: Evaluation against specification

Task 13: Evaluation

JUN
20

4. Evaluating - 3D Bobblehead Pen

Summative Task Thursday at 9:00 AM

Students to complete the two tasks for evaluation:

1. Evaluation against Specification

2. Evaluation - improvements

CURRICULUM

MYP Objectives

- **A: Inquiring and analysing**
  - i. explain and justify the need for a solution to a problem
    ii. construct a research plan, which states and prioritizes the primary and secondary research needed to develop a solution to the problem
    iii. analyse a group of similar products that inspire a solution to the problem

- **B: Developing ideas**
  - i. develop a design specification, which outlines the success criteria for the design of a solution based on the data collected
    ii. present a range of feasible design ideas, which can be correctly interpreted by others
    iii. present the chosen design and outline the reasons for its selection

- **C: Creating the 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
    ii. demonstrate excellent technical skills when making the solution
    iii. follow the plan to create the solution, which functions as intended

iv. explain 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
    ii. explain the success of the solution against the design specification
    iii. describe how the solution could be improved

Content & Skills

Skills

• All of the tasks/skills will be based on the criteria required to fulfill the design process (Inquiring, Developing, Creating and Evaluating) • The ability to plan a project from start to finish • How to produce and analyse the results from a consumer survey • In depth product analysis of an existing websites in terms of aesthetics, ethical issues and functionality. • Use of 3D graphics design packages to design their products in 3D. • The skill of using video tutorials to independently carry out tasks. • Use of Google classrooms and online based portfolios. • Use of modelling to develop a product solution. • The skill of printing in 3D using 3D printer.

3D Bobble-Head Project

ASSESSMENT

Tasks

OCT
4

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TASK 2B: Situation Analysis

TASK 3A: Product Analysis

TASK 3b: Product Analysis

TASK 3c: Product Analysis

TASK 4: Justifying the need

TASK 5: Research (Theses are extra optional tasks for a Level 8)

TASK 6: Design Brief

You must click SUBMIT on Google Classrooms once you have completed all tasks above.

5/8 A: Inquiring and analysing

N/A B: Developing ideas

N/A C: Creating the solution

N/A D: Evaluating

NOV
15

2. Developing Ideas - 3D Bobble Head Project

Summative Task Thursday at 9:00 AM

Students to complete the following Tasks:

TASKS

1. Specification
2. Moodboard
3. Design Ideas Sheet 1 (with annotations)
4. Design Ideas Sheet 2 (With Annotations)
5. Presenting your final Design
6. Reasons for selection and Requirements for creating your design

PLEASE NOTE: DO NOT complete Task 7 or 8 in this section

N/A ☐ A: Inquiring and analysing

4/8 ☑ B: Developing ideas

N/A ☐ C: Creating the solution

N/A ☐ D: Evaluating

JAN
12

3. Creating the Solution - 3D Bobble-head project

Summative Task Saturday at 9:00 AM

Students to complete the following tasks:

TASKS

9 . Plan for making

10. Creating the solution (Body and 3D printed Head)

11. FINISHED PRODUCT

N/A ☐ A: Inquiring and analysing

N/A ☐ B: Developing ideas

6/8 ☑ C: Creating the solution

N/A ☐ D: Evaluating

3D Bobble-Head Project

JAN
23

4. Evaluating - 3D Bobble-Head Project

Summative Task Wednesday at 9:00 AM

Evaluation

Tasks: Students to complete the evaluation tasks. Explanations are to be found in the portfolio.

N/A A: Inquiring and analysing

N/A B: Developing ideas

N/A C: Creating the solution

3/8 D: Evaluating

MAR
10

1. Inquiry and Analysis - 3D Bobble-head Project

Summative Task Sunday at 9:00 AM

Students to complete the following tasks:

Task 1: 3D printing

Task 2A - 2C: Product analysis

Task 3: Design Brief

All explanations of tasks can be found in Google drives portfolio.

NOTE: YOU DO NOT NEED TO UPLOAD ANYTHING TO MANAGEBAC. INSTEAD DO ALL WORK ON THE GOOGLE DRIVES PORTFOLIO

5/8 A: Inquiring and analysing

N/A B: Developing ideas

N/A C: Creating the solution

N/A D: Evaluating

MAR
31

2. Developing Ideas - 3D Bobble-head

Summative Task Sunday at 9:00 AM

Students to complete the following tasks:

Task 4: Design Specification

Task 5: Design Ideas x4

Task 6: Development of chosen design in 3D

Task 7: Orthographic Projection

Task 8: Capturing your face in 3D

Task 9: Final Design

N/A ☐ A: Inquiring and analysing

5/8 ☑ B: Developing ideas

N/A ☐ C: Creating the solution

N/A ☐ D: Evaluating

APR
4

2. Developing Ideas - 3D Bobblehead Project

Summative Task Thursday at 9:00 AM

Students to complete the following tasks

1. Design Specification

2. Developing Ideas x2

3. Developing Ideas x2

4. Presenting your chosen design development

5. Reasons for selection and requirements

6. Head in Meshmixer

7. Orthographic drawing

N/A ☐ A: Inquiring and analysing

5/8 ☑ B: Developing ideas

N/A ☐ C: Creating the solution

N/A ☐ D: Evaluating

MAY 16

3. Creating the Solution - 3D Bobblehead Project

Summative Task Thursday at 9:00 AM

Students to complete the Creation of the Pen in class using 3D printing and 3D modelling skills.

Students then need to display their finished project on their portfolios, showing 3 angles of photographs.

N/A A: Inquiring and analysing

N/A B: Developing ideas

5/8 C: Creating the solution

N/A D: Evaluating

MAY 30

3. Creating the Solution - 3D Bobble-head Project

Summative Task Thursday at 9:00 AM

Students to complete the following tasks:

Task 10: Plan for Making

Task 11: Creating the Solution

N/A A: Inquiring and analysing

N/A B: Developing ideas

5/8 C: Creating the solution

N/A D: Evaluating

3D Bobble-Head Project

JUN 20

4. Evaluating - 3D Bobble-head Project

Summative Task Thursday at 9:00 AM

Students to complete

Task 12: Evaluation against specification

Task 13: Evaluation

N/A A: Inquiring and analysing

N/A B: Developing ideas

N/A C: Creating the solution

N/A D: Evaluating

JUN 20

4. Evaluating - 3D Bobblehead Pen

Summative Task Thursday at 9:00 AM

Students to complete the two tasks for evaluation:

1. Evaluation against Specification

2. Evaluation - improvements

N/A A: Inquiring and analysing

N/A B: Developing ideas

N/A C: Creating the solution

8/8 D: Evaluating

MYP Assessment criteria

Design

5/8 A: Inquiring and analysing

5/8 B: Developing ideas

5/8 C: Creating the solution

N/A D: Evaluating

* - Class mean of Assessed Criteria

LEARNING EXPERIENCES

Learning experiences

- Students will be encouraged and provided video learning opportunities, to learn new software's independently.
- Teacher will give class tutorials for everyone to follow in class.
- Teacher will use the previous knowledge of students that have used Google Sketchup (3D packages) and apply it to Autodesk Meshmixer, another 3D package.
- Students will be taught through video and visual learning when demonstrations of 3D printing are shown.
- Students will be encouraged to work together and assist one another to when using sophisticated software and design packages.
- Students will be encouraged to make mistakes and learn from the mistakes.

Differentiation

- Students will be given extra support who struggle with using sophisticated software independently.
- Students who struggle with tasks will be encouraged to sit with peers who do not so they can share knowledge and skills among each other.
- Differentiation of individual students will be assessed when the unit starts, depending on the students individual needs.
- Students will be provided with exemplar work of previous examples or other units to help them with layout of their portfolio and level of detail required for different tasks.

CONNECTIONS

Approaches to Learning

Linked objectives

Design

- **A: Inquiring and analysing**
  - iii. analyse a group of similar products that inspire a solution to the problem
- **B: Developing ideas**
  - ii. present a range of feasible design ideas, which can be correctly interpreted by others
- **C: Creating the solution**
  - ii. demonstrate excellent technical skills when making the solution

Communication

I. Communication skills

Exchanging thoughts, messages and information effectively through interaction

- 1. Give and receive meaningful feedback
- 5. Use a variety of media to communicate with a range of audiences

Reading, writing and using language to gather and communicate information

- 23. Organize and depict information logically

I. Communication skills

In order for students to, (design objective C v), present the solution as a whole **they will need to**, (I. Communication skills - 1) Give and receive meaningful feedback**. The skill strategies that will be explicitly taught and practised are**: Students will use Google drives platform to present their work, receive feedback from the teacher and then reply to the feedback using the “reply” buttons/tools.

In order for students to, (design objective B iv), develop accurate planning drawings/diagrams and outline requirements for the creation of the chosen solution. **they will need to**, (I. Communication skills 5) Use a variety of media to communicate with a range of audiences**. The skill strategies that will be explicitly taught and practised are**: Students will learn to use 3D graphics software (Autodesk Meshmixer) to produce their Designs in 3D. And then present screenshots of this on another media platform called Google drives to present their work to their teacher. Thereafter students will learn to convert their work to a suitable format for printing in 3D.

In order for students to, (design objective C v), present the solution as a whole **they will need to**, (I. Communication skills - 23) Organize and depict information logically**. The skill strategies that will be explicitly taught and practised are**: Students will learn how to convert work into a digital format and use a present tool in Google Classroom to share their work.

Self-management

III. Organization skills

Managing time and tasks effectively

- 6. Bring necessary equipment and supplies to class
- 8. Use appropriate strategies for organizing complex information
- 10. Select and use technology effectively and productively

V. Reflection skills

(Re-)considering the process of learning; choosing and using ATL skills

- 23. Focus on the process of creating by imitating the work of others

Research

VI. Information literacy skills

Finding, interpreting, judging and creating information

- 10. Understand and use technology systems

VII. Media literacy skills

Interacting with media to use and create ideas and information

- 15. Locate, organize, analyse, evaluate, synthesise and ethically use information from a variety of sources and media (including digital social media and online networks)
  - c) I express opinions respectfully about the work of

III. Organization skills

In order for students to, (design objective B ii), present a range of feasible design ideas, which can be correctly interpreted by others **they will need to**, (III. Organization skills - 6) Bring necessary equipment and supplies to class**. The skill strategies that will be explicitly taught and practised are**: Students will need to bring their own devices (Laptop / Camera / Smartphones etc) So they can work through their e-portfolios on Google classrooms. Cameras or smartphones will be used to take images of any work done on paper to transfer onto their portfolio.

In order for students to, (design objective A iii). analyse a group of similar products that inspire a solution to the problem **they will need to**, (III. Organization skills - 8) Use appropriate strategies for organizing complex information**. The skill strategies that will be explicitly taught and practised are**: Learn how to summarise and present complex information in the form of diagrams and Mindmaps. Use acronyms such as CAFQUES to provide a structure for analysing a Bobblehead products.

V. Reflection skills

In order for students to, (design objective A iii). analyse a group of similar products that inspire a solution to the problem **and** (design objective C iii), follow the plan to create the solution, which functions as intended **they will need to**, (V. Reflection skills - 23) Focus on the process of creating by imitating the work of others**. The skill strategies that will be explicitly taught and practised are**: Students will use CAFQUES to analyse other bobbleheads, then use this to inspire their own designs.

VI. Information literacy skills

In order for students to, (design objective C ii), demonstrate excellent technical skills when making the solution **they will need to**, (VI. Information literacy skills -10) Understand and use technology systems**. The skill strategies that will be explicitly taught and practised are**: Students will learn how to use 3D softwares to design their Bobbleheads in 3D. Thereafter they will learn how to convert these into formats ideal for printing and learn how to use the 3D printer.

others.

- 18. Understand the impact of media representations and modes of presentation
  • a) I create works that are appropriate in style, tone and structure for the required genre, e.g. essay, report, speech, resume, letter, etc
- 20. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
  • b) I try new ways to communicate, present and use information. eg visual/audio technology, social media, blogs.

VII. Media literacy skills

In order for students to, (design objective C v), present the solution as a whole **they will need to**, (VII. Media literacy skills - 18) Understand the impact of media representations and modes of presentation**. The skill strategies that will be explicitly taught and practised are**: Students will learn to present their work and designs in the form of an e-portfolio.

In order for students to, (design objective C v), present the solution as a whole **they will need to**, (VII. Media literacy skills - 20) Communicate information and ideas effectively to multiple audiences using a variety of media and formats**. The skill strategies that will be explicitly taught and practised are**: Students will learn to use a 3D graphics software (Autodesk Meshmixer) to produce their Bobblehead product in 3D. Thereafter, present screenshots of this on another media platform called Google drives to present their work to their teacher. Students will learn to use still cameras to present their hard copy work and use “screen capture” and “file transfer skills” to transfer work over from one platform to another. Students will also learn to use a 3D printer to present their product as a 4 dimensional product.

Thinking

VIII. Critical thinking skills

Analysing and evaluating issues and ideas

- 17. Use models and simulations to explore complex systems and issues

VIII. Critical thinking skills

In order for students to, (design objective C ii), demonstrate excellent technical skills when making the solution **they will need to**, (VIII. Critical thinking skills - 17) Use models and simulations to explore complex systems and issues**. The skill strategies that will be explicitly taught and practised are**: Using youtube video tutorials and online “help support” to learn how to use “Autodesk Meshmixer” (3D graphics software) as well as diagnose any issues they face during the use of Autodesk Meshmixer. Students will also learn about 3D printing methods and processes.

X. Transfer skills

Utilizing skills and knowledge in multiple contexts

- 37. Combine knowledge, understanding and skills to create products or solutions

X. Transfer skills

In order for students to, (design objective C ii), demonstrate excellent technical skills when making the solution **they will need to**, (X. Transfer skills - 37) Combine knowledge, understanding and skills to create products or solutions**. The skill strategies**

that will be explicitly taught and practised are: Students will learn new 3D software packages (Autodesk Meshmixer) that can be used to print in a 3D printer.

IB Learner Profile

- Inquirers: During the process of Research
- Thinkers: During the process of designing their 3D bobble-head figurines
- Communicators: During presentation of their designs in their portfolio.
- Risk takers: During the Making and designing process.

Service as Action

- Work collaboratively with others: Students will demonstrate their talent, skills, and ideas by producing their designs as a 3D printed product

REFLECTIONS

2018 - 2019