



Activity description

Pupils are asked to design a wallet, purse, or credit card holder for a target consumer, and explain the rationale underlying their design.

Suitability

Pupils working individually or in pairs

Time

1 hour upwards

AMP resources

Pupil stimulus

Equipment

Stiff paper or card
Scissors, sticky tape or glue
Range of cards including credit cards, library tickets, bus pass, etc
Dimensions of £5/ £10/ £20 notes

Key mathematical language

Scale drawing, plan, dimension, measure, length, area, volume, bounds, error

Key processes

Representing Selecting mathematical information, methods and tools to use.

Analysing Working systematically, considering different possible outcomes, generating accurate measurements and diagrams.

Interpreting and evaluating Interpreting findings and relating these to the context of the task, evaluating and modifying designs.

Communicating and reflecting Communicating decisions and findings effectively, reflecting on the approach.



Teacher guidance

Teachers may wish to start the activity by placing it in the context of 'Dragon's Den'. Explain that the activity is to design a wallet, purse or credit card holder for a specific target consumer. You can engage the class on determining the target consumer. This activity is well-suited for cross-curricular collaboration with Design & Technology.

Discuss typical contents of a wallet or purse for the target consumer, and encourage pupils to collect data if it is appropriate. Also discuss how the contents could be arranged within the wallet or purse for convenience and security. As this activity could involve reference to donor cards or medical ID, you may need to be aware of sensitivities within the class. Information on dimensions of various banknotes can be found online via websites such as <http://www.bankofengland.co.uk/banknotes/current/>.

Allow lesson time or homework time for pupils to decide what their wallets will accommodate, and for measurements to be taken, before progressing to the design stage. They should be able to explain the reasons underlying their choices, mathematically where appropriate.

Encourage pupils to do rough design work before committing themselves to a single design. If possible, pupils should build a card replica of their design to help them assess how convenient the wallet would be to use, and to ensure that designs convey all the necessary information.

Probing questions and feedback

AMP activities are well suited to formative assessment, enabling pupils to discuss their understanding and decide how to move forward. See www.nuffieldfoundation.org/whyAMP for related reading.

- Who is your target consumer, and how did you decide what their wallet should be able to hold?
- How did you decide on the dimensions and how the contents would be arranged in the wallet?
- Draw and describe your design on paper so that someone else can create your design without further information.
- What difficulties did you encounter in creating the card replica?
- Do you notice any features of the card replica that were not apparent in your design? How might these help you to refine your design?
- Are there any design features that you would change? Why?

Extensions

- A survey of requirements of target consumers could be explored at the start.
- Pupils consider costs of putting the design into production, and how the design might be modified to reduce costs.
- Pupils investigate how a design can be modified for other consumer groups.

Progression table

The table below can be used to:

- share with pupils the aims of their work
- facilitate self- and peer-assessment
- help pupils review their work and improve on it

The table supports formative assessment but does not provide a procedure for summative assessment. It also does not address the rich overlap between the processes nor the interplay of processes and activity-specific content. Please edit it as necessary.

Representing <i>Identifying relevant information and choice of representations</i>	Analysing <i>Sourcing and analysing data and producing different designs</i>	Interpreting and evaluating <i>Relating findings to the original task and justifying choices</i>	Communicating and reflecting <i>Presenting findings and reflecting on approach to the task</i>
Shows understanding of the task by identifying data that needs to be collected and choosing some design features	Uses chosen features to develop a basic design	Makes an attempt at relating the design to the needs of the target consumer	Communicates basic choices; Sketch of design with some dimensions shown
Develops task in a particular way, e.g. chooses a target consumer and identifies a range of appropriate design features	Combines different features in the design, including dimensions; If relevant, conducts a simple survey of consumer opinion	Justifies some design features and decisions; If relevant, incorporates survey results into design	Begins to communicate findings and decisions; Design is presented in sufficient detail for someone else to replicate at least part of the design
Identifies bounds for certain dimensions and uses other relevant mathematical methods	Uses a variety of inputs to inform different features of the design in a mostly accurate scale drawing	Provides adequate justification for the features included or not included in the design	Clearly communicates the approach taken along with a detailed design that would enable prototyping
Uses physical as well as abstract representations; Recognises any limitations of chosen representations and attempts to address these	Accurate scale drawings are used effectively and analysed taking consumer needs and preferences into account	Studies strengths and weaknesses of design by using a prototype and/or target consumer feedback and uses this to improve the product	In addition to communicating relevant features and choices, reflects on the design process



No sample responses are included in this version. We would be delighted to have and incorporate samples of your pupil work in future versions. Please contact us and/or look for updates at www.nuffieldfoundation.org/AMP.