

Visual Communication Design Units 3 & 4

Chapter 1 — The VCD design process & design thinking

This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

Attribution: Classbasics Pty Ltd, vwx.au

Aboriginal and Torres Strait Islander content has been excluded as accuracy cannot be guaranteed, and it is better to be respectful than cover the entire curriculum inaccurately.

Significant effort has been made to ensure this content is legal. Please send any areas of concern to admin@vwx.au with appropriate document/legal references so errors can be verified and changes be made.

Contents

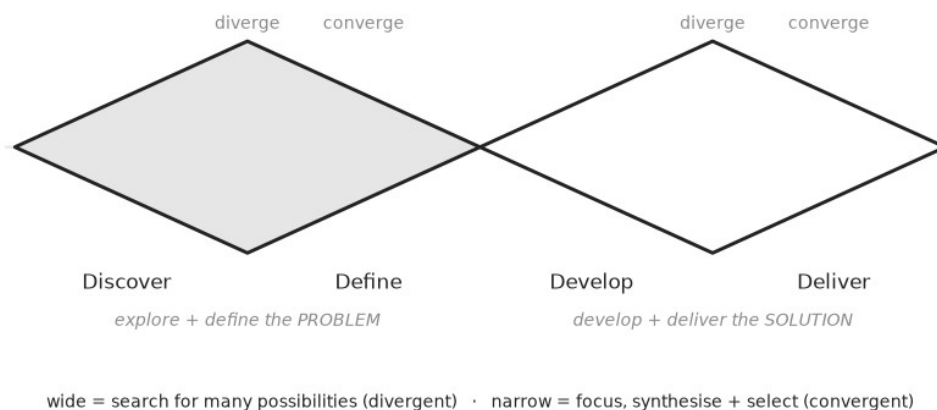
Section	Page
1A The VCD design process: Discover, Define, Develop, Deliver	2
1B Divergent and convergent thinking strategies	10
1C Design ideas, concepts and solutions	18

Chapter 1 The VCD design process and design thinking — 1A The VCD design process: Discover, Define, Develop, Deliver

Theory

The **VCD design process** is the staged, iterative way of working that students of VCE Visual Communication Design use to move from a design problem to a resolved design solution. It is adapted from the **Double Diamond** model developed by the **Design Council (UK)**, and it organises design work into four distinct phases: **Discover, Define, Develop and Deliver**.

A design process is **situational and relational** — designers tailor their approach to the problem at hand and to the people involved — so no two projects run in exactly the same way. What stays constant are the *modes of thinking* and the *phases of development* that the four-phase model captures.



Two diamonds, two kinds of thinking. Each diamond widens and then narrows. The widening (left) half of a diamond is **divergent thinking** — searching widely, suspending judgement, keeping the mind open to many possibilities. The narrowing (right) half is **convergent thinking** — synthesising, focusing and selecting. The four phases map onto the diamonds like this:

- **Discover = divergent** — open up the problem.
- **Define = convergent** — settle on the right problem (the brief).
- **Develop = divergent** — open up possible solutions.
- **Deliver = convergent** — resolve and present the chosen solution.

The first diamond explores and defines the **problem**; the second develops and delivers the **solution**.

What the designer does in each phase.

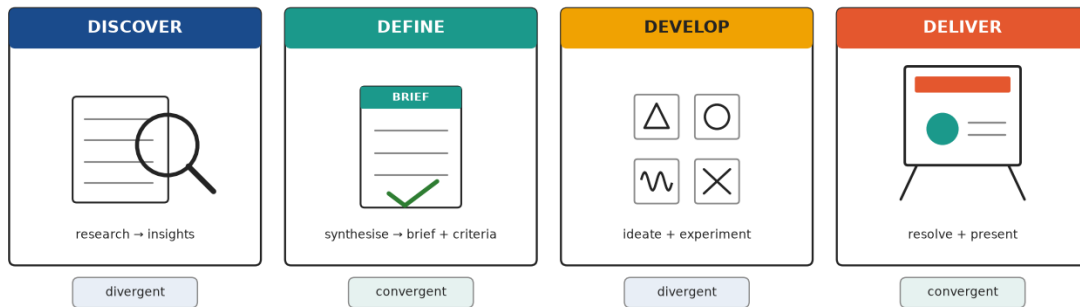
Discover — the designer gathers insights into the problem, using research methods that are often **human-centred** to understand the needs and experiences of stakeholders (for example interviews, surveys, audience or user personas, competitor analysis and secondary research). Thinking is **divergent**: the designer searches widely for new information and perspectives, suspending judgement.

Define — the designer uses **convergent** thinking to synthesise and make sense of the research, reviewing, categorising and summarising it in order to clarify or reframe the problem. From these insights the designer writes a **brief**, identifying a client and their **communication need/s** and detailing the **purpose, context, audience or users** and a list of **constraints**. The brief sets **design criteria** that are used to evaluate the success of design ideas.

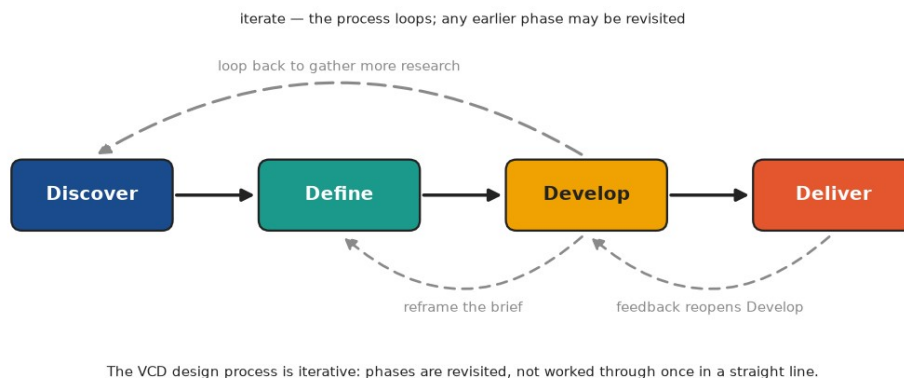
Develop — thinking becomes **divergent** again. The designer seeks and analyses inspiration from a wide range of sources and generates imaginative **design ideas** aligned with the communication need. They brainstorm with words and images, use **rapid drawing and making** methods, and experiment with the **design elements and principles** and

a range of **methods, media and materials**. **Annotations** describe design decisions and evaluate ideas against the brief.

Deliver — thinking returns to **convergent**. Reflecting critically, and using the **design criteria** together with **feedback**, the designer selects and refines the ideas with the most potential, developing them into **design concepts** for testing, iteration and evaluation. Methods, media and materials are combined with selected elements and principles to **resolve** final features and details, and an appropriate **presentation format** is chosen to communicate the finished **design solution** for **client approval** and for the **processes of production or implementation** — so the presentation must not only win the client's agreement but also carry enough resolved detail for the solution to be made, built or put into use by others.



The process is iterative. Students *pass through and revisit* the four phases — the process is not a one-way straight line. A discovery made while developing ideas can send the designer back to gather more research or to reframe the brief; feedback on a delivered concept can reopen the Develop phase. Across the course you apply the phases over two units — Discover, Define and Develop in Unit 3, then Deliver in Unit 4 — looping back to earlier phases whenever new insight or feedback requires it.



The vocabulary follows the phases. As the work converges, the name for what the designer is holding changes — and each name belongs to a phase, so use the term that matches the phase the question is about: **design ideas** are the broad range of rapid, imaginative options generated in **Develop**; **design concepts** are the selected ideas that **Deliver** refines, tests and evaluates; the **design solution** is the resolved outcome that Deliver presents for client approval. Subtopic 1C defines the three terms in full, together with the drawing purposes and prototype fidelities that belong with each.

Watch-out — **map the RIGHT activity to the RIGHT phase**. Writing the brief is **Define**, not Discover; generating a wide range of rough ideas is **Develop**, not Deliver; resolving and presenting the final solution is **Deliver**. Placing an activity in the wrong phase is a common way to lose marks.

Watch-out — **the process is iterative, not linear**. Do not describe it as a single straight run from Discover to Deliver. Phases are **revisited** — research is revisited, the brief is reframed, concepts are re-tested. If a question is about the process as a whole, say that it loops back.

Watch-out — keep divergent and convergent straight. **Discover** and **Develop** *diverge* (open up, explore widely, suspend judgement); **Define** and **Deliver** *converge* (synthesise, focus, select, refine). Naming the wrong mode for a phase loses the mark.

Watch-out — “developing design criteria” is not the Develop phase. Design criteria are built from the insights gathered in **Discover** and written into the brief in **Define**; **Develop** then generates ideas *against* criteria that already exist. Assessors report that students who read “development of their design criteria” as the Develop phase wrote about prototypes, feedback and iterating an existing design, instead of the initial research that shapes the design requirements — and lost marks for it.

Watch-out — the brief lives in Define. The brief and its **design criteria** are produced in **Define** and then used right through **Develop** and **Deliver** to evaluate ideas and concepts. Do not place the writing of the brief in Discover — Discover supplies the research the brief is built from — and do not treat the brief as the finished design.

Worked examples

Example 1 — scaffolded

A designer conducts interviews and surveys with stakeholders, gathering a wide range of insights about their needs and experiences while suspending judgement. (a) Identify the phase of the VCD design process being described. (b) Name the mode of thinking being used. (c) Explain why this mode of thinking suits this phase. (4 marks)

Working	Comment
(a) The phase is Discover .	The activity is human-centred research to gather insights — the defining work of Discover. The first job is to map the activity to the RIGHT phase.
(b) The mode of thinking is divergent thinking.	Discover sits on the widening (left) half of the first diamond, so the mode is divergent — do not say convergent.
(c) Divergent thinking suits Discover because the designer needs to search widely for new information and perspectives and to suspend judgement , keeping the mind open to many possibilities before the process later narrows down.	“Explain” needs a because/so chain, not a definition. Tie the mode to what the phase actually requires.

Example 2 — scaffolded

*Distinguish between the **Develop** and **Deliver** phases of the VCD design process. (4 marks)*

Working	Comment
In Develop , the designer thinks divergently , generating a broad range of experimental design ideas and experimenting freely with elements, principles, methods, media and materials.	Name the phase’s thinking mode AND its characteristic output (ideas). “Distinguish” needs a congruent two-sided treatment.
In Deliver , the designer thinks convergently , using the design criteria and feedback to select, refine and resolve the strongest ideas into design concepts and a final solution .	Give the matching point for the other phase: converge, select/refine/resolve, concepts and solution.
So Develop opens up many possibilities (divergent, ideas), while Deliver narrows to a resolved outcome (convergent, concepts and solution).	State the contrast explicitly, and keep the idea ≠ concept vocabulary precise — that is where the marks are.

Example 3 — unscaffolded

Explain the role of divergent and convergent thinking in the VCD design process, with reference to the two diamonds. (4 marks)

The VCD design process alternates between two modes of thinking, one for each half of each diamond. **Divergent thinking** widens the process: the designer searches broadly and suspends judgement to open up possibilities. It drives **Discover** (opening up the problem through wide-ranging research) and **Develop** (opening up solutions by generating many imaginative ideas). **Convergent thinking** narrows the process: the designer synthesises, focuses and selects. It drives **Define** (synthesising research into a brief that reframes the right problem) and **Deliver** (selecting and refining ideas into a resolved concept and solution). Each diamond therefore widens with divergent thinking and then narrows with convergent thinking — the first diamond around the problem, the second around the solution — so the designer explores fully before committing.

Example 4 — unscaffolded

A student states: “The VCD design process is a straight line — you research, write a brief, draw some ideas, then hand over the finished design.” Discuss the extent to which this is an accurate description of the VCD design process. (4 marks)

The statement captures the general **forward order** of the four phases — Discover (research), Define (the brief), Develop (drawing ideas) and Deliver (the finished solution) — so it is partly accurate. However, it is misleading, because the VCD design process is **iterative, situational and relational**, not a one-way straight line. Designers *pass through and revisit* phases: an insight gained while developing ideas can send them back to gather more research or to reframe the brief, and feedback on a concept can reopen the Develop phase. The statement also ignores the shifts between **divergent and convergent thinking** that shape each phase. A more accurate description is that the designer moves forward through Discover, Define, Develop and Deliver while **looping back** to earlier phases whenever new insight or feedback requires it.

Practice questions

Scaffolded

Q1. About the model: (a) Name the design-process model that the VCD design process is adapted from, and the organisation that developed it. (1 mark) (b) Name, in order, the four phases of the VCD design process. (2 marks) (c) State what the widening and narrowing of each diamond represent about a designer’s thinking. (2 marks)

Q2. Match each activity to the phase of the VCD design process it belongs to (Discover, Define, Develop or Deliver): (a) Building audience or user personas from research into the people who will use the design. (1 mark) (b) Reviewing, categorising and summarising research findings in order to reframe the problem. (1 mark) (c) Rapidly sketching a broad range of imaginative ideas. (1 mark) (d) Resolving a chosen concept and selecting a presentation format for the client. (1 mark)

Q3. About thinking: (a) Name the mode of thinking used in the Discover phase. (1 mark) (b) Name the mode of thinking used in the Define phase. (1 mark) (c) Explain the difference between divergent and convergent thinking. (2 marks)

Q4. The Define phase: (a) Identify the document that is produced in the Define phase. (1 mark) (b) List three things that a brief details. (3 marks) (c) State what the design criteria in the brief are used for. (1 mark)

Q5. The Develop phase: (a) Name the mode of thinking used in the Develop phase. (1 mark) (b) List two methods or techniques a designer uses to generate design ideas. (2 marks) (c) State what annotations are used for during the Develop phase. (1 mark)

Q6. Explain why a design process is described as **situational and relational**. (3 marks)

Unscaffolded

Q7. Describe what a designer does in the **Discover** phase of the VCD design process. (3 marks)

Q8. A student writes that a designer “develops their design criteria in the **Develop** phase.” Explain why this is incorrect, and identify where the design criteria actually come from. (3 marks)

Q9. Both the **Define** and the **Deliver** phases use convergent thinking. Compare these two phases, referring to what the designer narrows down in each and what each phase produces. (4 marks)

Q10. Explain how a design project moves from a design problem to a resolved design solution, naming what the designer produces by the end of **each** of the four phases and showing how each output feeds into the next. (6 marks)

Q11. Distinguish between the **Discover** and **Define** phases of the VCD design process. (4 marks)

Questions 12–14 refer to the following scenario.

A design studio is developing wayfinding signage for a new community library. (1) The team first interviews library visitors and staff and researches the signage of similar libraries. (2) They then write a brief setting out the client, the communication need, the audience and the constraints. (3) Next they rapidly sketch many different sign ideas. (4) Finally they resolve one concept as a scale drawing and present it to the library board for approval.

Q12. At stage (1) the team both interviews library visitors and staff *and* researches the signage of similar libraries. Explain what each of these two kinds of research contributes, and how together they prepare the team for stage (2). (4 marks)

Q13. After stage (4), the library board reports that many library visitors have low vision and find the drafted signs hard to read. Explain which phase or phases the studio should return to and what they would do there, and state what this shows about the way the VCD design process works. (3 marks)

Q14. Explain how the design criteria written in the brief (stage 2) would be used later, when the team presents the resolved concept to the library board (stage 4). (3 marks)

Q15. Compare the **Discover** and **Develop** phases of the VCD design process, referring to their similarities and their differences. (4 marks)

Q16. In the **Deliver** phase the designer chooses an appropriate presentation format to communicate the finished design solution — both for **client approval** and for the **processes of production or implementation**. Explain what each of these two jobs requires of the presentation, and name **one** presentation format that could serve both. (4 marks)

Answers

Q1. (a) The Double Diamond model, developed by the Design Council (UK). (b) Discover, Define, Develop, Deliver. (c) Widening = divergent thinking (exploring widely); narrowing = convergent thinking (focusing and selecting). **Q2.** (a) Discover. (b) Define. (c) Develop. (d) Deliver. **Q3.** (a) Divergent. (b) Convergent. (c) Divergent = searching widely and suspending judgement to open up possibilities; convergent = synthesising, focusing and selecting. **Q4.** (a) The brief. (b) Any three of: client and communication need/s; purpose; context; audience or users; constraints. (c) To evaluate the success of design ideas. **Q5.** (a) Divergent. (b) Any two of: rapid drawing and making; brainstorming with words and images; ideation sketching; prototyping. (c) To describe design decisions and evaluate ideas against the brief. **Q6.** Situational = the approach is tailored to the particular problem; relational = the process depends on and responds to people (stakeholders, client, users, peers). See solutions. **Q7–Q16.** See fully-worked solutions.

Fully-worked solutions

Q1. (a) The **Double Diamond** model, developed by the **Design Council (UK)**. (b) In order: **Discover, Define, Develop, Deliver**. (c) The **widening** of a diamond represents **divergent thinking** — the designer opening up the problem or the range of ideas by exploring widely; the **narrowing** represents **convergent thinking** — synthesising, focusing and selecting (*2 marks: widening→divergent, narrowing→convergent*).

Q2. (a) **Discover** — human-centred research into the audience or users, gathering insights. (b) **Define** — the convergent synthesis of research findings; note that this is Define, not Discover, because the research was *gathered* in Discover and is *made sense of* here. (c) **Develop** — generating a broad range of ideas. (d) **Deliver** — resolving a concept and choosing a presentation format (*1 mark each; the point of the item is mapping the RIGHT activity to the RIGHT phase*).

Q3. (a) **Divergent** thinking. (b) **Convergent** thinking. (c) **Divergent thinking** searches widely for new information and possibilities while suspending judgement, so the process opens up; **convergent thinking** synthesises, focuses and selects, so the process narrows toward a decision (*2 marks: one clear point about each mode*).

Q4. (a) The **brief**. (b) Any three of: the **client** and their **communication need/s**; the **purpose**; the **context**; the **audience or users**; the **constraints**. (c) The **design criteria** are used to **evaluate the success of design ideas** (and later concepts) against the brief (*3 + 1 marks*).

Q5. (a) **Divergent** thinking. (b) Any two of: **rapid drawing and making**; **brainstorming with words and images**; **ideation sketching**; **prototyping**. (c) **Annotations** are used to **describe design decisions and evaluate ideas against the brief** (*marks for the exact functions, not just “to label”*).

Q6. A design process is **situational** because the designer tailors the approach to the particular problem at hand — the research, methods and emphasis change from project to project, so there is no single fixed recipe. It is **relational** because the process depends on, and responds to, people: the designer researches stakeholders, works to a client’s communication need, seeks feedback and critique from peers, and presents solutions for client approval. Because the problem and the people differ each time, no two runs of the process are identical (*3 marks: situational explained + relational explained + why this makes each project different*).

Q7. In the **Discover** phase the designer **gathers insights** into the problem at hand. Using **divergent thinking**, they search widely and suspend judgement, applying research methods that are often **human-centred** — such as interviews, surveys, audience or user personas, competitor analysis and secondary research — to understand the **needs and experiences of stakeholders**. The aim is to open up the problem and collect a broad base of information before the process later narrows (*3 marks: gather insights + divergent/human-centred research + example methods*).

Q8. The statement is **incorrect**. Design criteria are set out in the **brief**, and the brief is written in the **Define** phase — so the criteria are developed in Define, out of the insights gathered in **Discover**. The designer synthesises that research into the client’s **communication need/s**, the **purpose**, the **context**, the **audience or users** and the **constraints**, and those requirements are the design criteria. The **Develop** phase does not write the criteria; it generates design ideas *against* criteria that already exist, annotating them to evaluate each idea in light of the brief. The confusion comes from the word “develop”: *developing design criteria* means shaping initial research into design requirements, not working in the Develop phase (*3 marks: criteria are established in the brief in Define; they grow out of the research gathered in Discover; Develop applies them rather than writing them*).

Q9. Both phases are **convergent**: in each the designer synthesises, focuses and selects rather than searching widely. They differ in *what* is narrowed and in *what* each produces. In **Define** the designer narrows the **research** — reviewing, categorising and summarising the insights gathered in Discover in order to clarify or reframe the problem — and the output is the **brief**, which identifies the client and their communication need/s and details the purpose, context, audience or users, constraints and the **design criteria**. In **Deliver** the designer narrows the **design ideas** — using those same criteria, together with **feedback**, to select and refine the ideas with the most potential — and the output is a resolved **design concept** and the finished **design solution**, presented for client approval. So Define closes the first diamond around the **problem**, while Deliver closes the second around the **solution** (4 marks: congruent two-sided treatment — *what is narrowed and what is produced in each* — plus the shared convergent mode and the placement on the two diamonds).

Q10. The four phases hand the work forward, each producing something the next phase needs. **Discover** produces a broad base of **research insights** into the problem and into the needs and experiences of stakeholders, gathered with research methods that are often human-centred. Those insights are what **Define** synthesises — reviewing, categorising and summarising them to clarify or reframe the problem — producing the **brief**, with the client's communication need/s, the purpose, context, audience or users, constraints and **design criteria**. The brief is what **Develop** works from: aligned with the communication need, the designer generates a broad range of imaginative **design ideas**, annotating them to evaluate them against the brief. Those ideas are what **Deliver** narrows: using the criteria and feedback, the designer selects and refines the strongest into a **design concept**, resolves its final features and details, and presents the finished **design solution** in an appropriate format for client approval. Because each output becomes the next phase's raw material, a weak output early in the chain — thin research, or a vague brief — limits everything after it, which is also why designers **loop back** to an earlier phase when its output proves inadequate (6 marks: the output of each of the four phases + how each output feeds the next + the consequence of the chain).

Q11. In **Discover**, the designer uses **divergent** thinking to **gather insights**, researching stakeholders widely and suspending judgement to open up the problem. In **Define**, the designer switches to **convergent** thinking to **synthesise** that research — reviewing, categorising and summarising it — in order to reframe the problem and write the **brief** with its design criteria. The two phases make up the **first diamond**: Discover widens it and Define narrows it. The key differences are the **mode of thinking** (divergent vs convergent) and the **output** (a body of research insight vs a defined brief), while both share the same purpose of understanding and framing the **problem** before any solutions are drawn (4 marks: congruent two-sided treatment — *mode and output for each* — plus the shared problem-space purpose).

Q12. The two kinds of research answer different questions, and the team needs both. Interviewing library visitors and staff is **human-centred** research: it gives first-hand insight into the **needs and experiences** of the people who will use the signs — where visitors actually get lost, which rooms staff are asked for at the desk, and the words people use for them. Researching the signage of similar libraries is a **competitor analysis**: it shows how the same communication need has already been answered elsewhere, what works, what fails and which conventions visitors will already expect. Both are done with **divergent** thinking, so gathering from two directions widens the base of evidence while judgement is still suspended. At stage (2) that combined evidence is what the team synthesises into the brief: the interviews establish the audience and the real communication need, while the competitor findings help set realistic constraints and design criteria (4 marks: *what the interviews contribute; what the competitor research contributes; divergent breadth; how both feed the brief written at stage 2*).

Q13. The board's feedback shows that the audience was not fully understood, so the studio should loop back rather than press on. They would return to **Discover** to research the visual needs of visitors with low vision, and then to **Define** to reframe the brief — revising the design criteria to specify, for example, a minimum letter height, strong tonal contrast and clear sans serif type — before re-entering **Develop** and **Deliver** to generate, resolve and re-present signs that meet the revised criteria. This is what it means to call the VCD design process **iterative**: designers *pass through and revisit* phases as new insight or feedback emerges, rather than working through the four phases once in a straight line (3 marks: *the phase or phases returned to, with a reason; what is done there; the process is iterative, not linear*).

Q14. The **design criteria** written in the brief set out what a successful solution must achieve for this client (for example legibility for library visitors, suitability for the context, and working within the stated constraints). When the team presents the resolved concept to the library board, those criteria provide the **benchmark for evaluation**: the concept is judged, point by point, on how well it meets each criterion, and the board's feedback is framed against

them. In this way the criteria written back in **Define** continue to guide **testing, evaluation and refinement** in the **Deliver** phase (3 marks: *criteria = the standard of success; used to evaluate/judge the concept; link back to the brief*).

Q15. The **Discover** and **Develop** phases are **similar** in that both use **divergent thinking** — in each, the designer searches widely, suspends judgement and opens the process up rather than narrowing it. They **differ** in focus and output: **Discover** opens up the **problem**, gathering research insight about stakeholders, whereas **Develop** opens up the **solution**, generating a broad range of imaginative design ideas that respond to the brief. Discover is the widening half of the **first** diamond; Develop is the widening half of the **second** (4 marks: *similarity — both divergent; difference — problem research vs solution ideas; placement on the two diamonds*).

Q16. The presentation has to do two jobs at once. For **client approval** it must communicate the resolved solution clearly and persuasively enough for the client to judge it against the **design criteria** in the brief and agree to it — showing what the solution looks like, how it works and how it answers the communication need. For the **processes of production or implementation** it must also carry enough **resolved detail** for other people to make, build or install it: the final features and details, the combinations of **methods, media and materials**, and specifications such as dimensions, scale and colour. That double job is why the format is chosen to suit the outcome and the field rather than simply to look attractive. **Documentation drawings presented on a concept board with a rendered impression** would serve both (accept a model, mock-up or high-fidelity prototype shown alongside documentation drawings): the rendering wins the client's approval, while the dimensioned drawings record what has to be produced (4 marks: *what client approval requires of the presentation; what production or implementation requires; why this governs the choice of format; one valid format named*).

Chapter 1 The VCD design process and design thinking — 1B Divergent and convergent thinking strategies

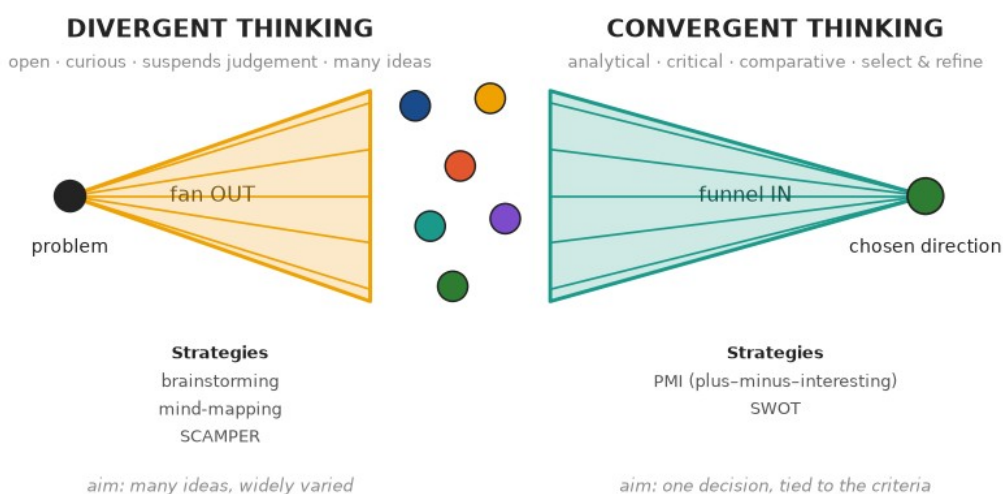
Theory

Design thinking describes the cognitive processes, strategies and routines designers use when developing solutions to problems. Designers assess the usefulness of original ideas and develop solutions that are not only innovative but also effective and fitting in their response to stakeholder needs. Design thinking therefore involves **both convergent and divergent thinking strategies**, together with a flexible and inventive mindset paired with synthesis and critical evaluation. In the examination you are expected to name these strategies, know which kind of thinking each belongs to, and — for Section B — *apply* a convergent strategy to your own design work.

Divergent thinking is open-minded, curious and imaginative. It suspends judgement, focusing instead on the multiple ways a problem might be solved in unusual, creative or unexpected ways. The aim is *quantity* — generate as many possibilities as you can before deciding anything — and, just as importantly, *range*: a broad set of genuinely different directions, not three minor variations of the one idea. The three divergent strategies to know by name are:

- **brainstorming** — rapidly listing every idea, no matter how unlikely, without stopping to judge;
- **mind-mapping** — branching outward from a central problem into related idea directions (see below);
- **SCAMPER** — prompting new options by asking how an idea could be *Substituted, Combined, Adapted, Modified, Put to another use, Eliminated or Reversed*.

Designers use other divergent prompts as well — reframing a problem as a “**how might we...**” question, or taking an unrelated **random word** as a jolt toward an unexpected direction — but name and apply the three above when a question asks you for a divergent thinking strategy.

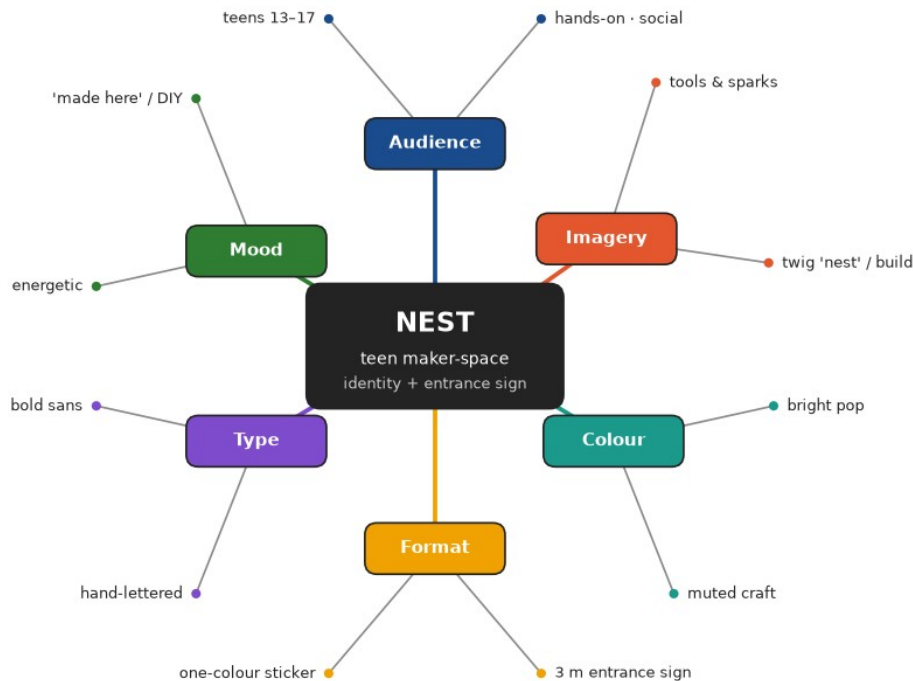


Convergent thinking is analytical, critical, reflective and comparative. It seeks to summarise, categorise and synthesise information in logical and efficient ways in order to clarify, reframe or resolve problems. Where divergent thinking *widens* the field, convergent thinking *narrows* it — comparing options against evidence and the brief, then selecting and refining the strongest. The two convergent strategies to know by name are:

- **PMI** — listing the *Pluses, Minuses and Interesting* points of one idea;
- **SWOT** — analysing a concept’s *Strengths, Weaknesses, Opportunities and Threats*.

These are the two the assessor reports give as examples when a question asks for a convergent thinking strategy, so they are the two you must be able to *apply*. Designers also score several concepts against shared criteria in an **evaluation or decision matrix**, or mark the options with the most potential in a group **dot-vote**. Whichever is used, the underlying move is the same: test the option **point-by-point against the design criteria** in the brief, and finish with a decision.

The two alternate through the VCD design process. Divergent and convergent thinking are not opposites to choose between — designers *move back and forth* between them across the four phases of the VCD design process (Chapter 1A). In **Discover**, designers think *divergently*, searching widely and suspending judgement to gather insights. In **Define**, they switch to *convergent* thinking to synthesise that research and write a brief whose **design criteria** will later be used to judge ideas. In **Develop**, they diverge *again*, brainstorming with words and images and rapidly generating a broad range of imaginative ideas. In **Deliver**, they *converge* once more, using the criteria and feedback to select, refine and resolve the strongest concept into a final solution. The same rhythm names the outputs: divergent thinking produces many **design ideas**, and convergent thinking selects and refines them into **design concepts** and, finally, a resolved **design solution**.



Mind-mapping — a divergent strategy: one central problem, many branching ideas

The mind-map above is a *divergent* strategy at work in the Develop phase for a fictional client, the *NEST* teen maker-space. From one central problem it branches out into many idea directions — audience, mood, imagery, colour, type, format — without yet judging any of them. Quantity comes first; selection comes later.

Applying a convergent strategy (the Section B skill). Section B of the examination asks you to *evaluate* your resolved concept using a convergent / critical-thinking strategy such as **PMI** or **SWOT**. The strategy is only worth marks when every point is tied to a stated **design criterion** from your brief — not to personal taste. A PMI lists what works, what does not and what is worth exploring about *one* idea; a SWOT weighs a concept's internal strengths and weaknesses against external opportunities and threats. Each ends in a **judgement**: keep, change or reject, and why.

PMI · evaluate one idea

+	Plus hand-made feel suits teens (crit. 1)
–	Minus fine twigs blur at 3 m (crit. 2)
?	Interesting works as a one-colour sticker?

SWOT · analyse a concept

S Strengths hand-made look appeals to teens	W Weaknesses detail clogs at small size
O Opportunities sticker set for members to swap	T Threats resembles a rival's mark

Both are convergent strategies — tie every point to a brief criterion.

Watch-out — match the strategy to the mode. Brainstorming, mind-mapping and SCAMPER are *divergent*; PMI and SWOT are *convergent*. Naming a strategy but putting it in the wrong mode is a common error — keep the two lists straight.

Watch-out — suspend judgement while diverging. Divergent thinking is not random or careless — it is *disciplined* idea generation that deliberately holds back criticism so ideas keep flowing. Judging ideas too early (or convergent thinking meaning “just pick your favourite”) shuts down the range of options.

Watch-out — tie the convergent strategy to the criteria. In Section B a PMI or SWOT earns marks only when each point is checked *against a design criterion from the brief*, point-by-point. Assessors report that students’ PMIs and SWOTs are frequently **generalised or descriptive rather than evaluative**, and that annotations which merely **repeat the design criteria** do not show how the concept addresses them. Higher-scoring responses link each point explicitly to a criterion and explain *how* a specific feature of the design satisfies it.

Watch-out — apply the strategy where it is asked for, not instead of what is asked for. Assessors report that students who submitted **brainstorms or mind maps in place of development drawings** limited the marks that could be awarded, because a written thinking strategy does not meet a requirement for drawings; and that students who annotated development drawings with a **general critical-thinking model such as a PMI** missed the marks for the methods, materials and media the question actually asked about. Read the question: produce the drawing or the annotation it names, and use a thinking strategy only where the question calls for one.

Watch-out — ideas vs concepts. Divergent thinking produces many rough **ideas**; convergent thinking selects and refines the strongest into fewer, more resolved **concepts**, and then one **solution**. Do not use the terms interchangeably.

Worked examples

Example 1 — scaffolded

Distinguish between divergent and convergent thinking, and name one strategy a designer would use for each. (3 marks)

Working	Comment
Divergent thinking is open-minded, curious and imaginative; it suspends judgement to generate many possible ways to solve a problem.	Distinguish = a congruent two-sided treatment. Give the study design’s definition of the FIRST mode.
Convergent thinking is analytical, critical and comparative; it summarises, categorises and synthesises information to select and refine the strongest option.	Now the SECOND mode, in the same terms, so the two sit side by side.
Divergent strategy: brainstorming (or mind-mapping / SCAMPER). Convergent strategy: a PMI (or SWOT). The key contrast: divergent thinking <i>widens</i> the field of ideas, while convergent thinking <i>narrows</i> it toward a decision.	Name a strategy for EACH, matched to the correct mode — mislabelling the mode is the common error. A distinguish answer states the essential difference (widen vs narrow) explicitly.

Example 2 — scaffolded

A designer has one idea for the NEST entrance sign — a hand-built twig “nest” wordmark. Apply a PMI to evaluate it against the brief criteria (appeal to teens; legible at 3 m; work in one colour), and state the resulting decision. (4 marks)

Working	Comment
Plus: the hand-built twig “nest” looks made-by-hand and creative, meeting the criterion <i>appeal to teens</i> .	PMI is a CONVERGENT strategy: list Pluses, Minuses and Interesting points, each tied to a criterion.
Minus: fine twig detail may fill in and blur at a distance, so it risks failing the criterion <i>legible at 3 m</i> .	The Minus must be a genuine weakness measured against a criterion, not a matter of taste.
Interesting: reduced to a single silhouette the mark	“Interesting” captures a possibility to explore, not yet a

Working	Comment
could work as a <i>one-colour</i> sticker — worth testing.	clear plus or minus.
Decision: keep the concept but simplify the twig detail, then re-test at 3 m and in one colour.	A convergent strategy ends in a JUDGEMENT tied to the criteria — this is exactly what Section B rewards.

Example 3 — unscaffolded

Explain how divergent and convergent thinking alternate across the four phases of the VCD design process. (4 marks)

Divergent and convergent thinking take turns across the process. In **Discover**, the designer thinks *divergently*, researching widely and suspending judgement to gather insights into the problem and its stakeholders. In **Define**, they switch to *convergent* thinking to synthesise and categorise that research and write a brief, setting the design criteria. In **Develop**, they diverge *again*, brainstorming and rapidly generating a broad range of imaginative ideas without judging them yet. In **Deliver**, they *converge* once more, using the criteria and feedback to select, refine and resolve the strongest concept into a final solution. So the process expands then focuses, expands then focuses — divergent to open up possibilities, convergent to make decisions (4 marks: correct mode named for each of the four phases with a reason).

Example 4 — unscaffolded

Describe two divergent thinking strategies a designer could use in the Develop phase, and explain how each helps generate a wide range of ideas. (4 marks)

Two divergent strategies are **brainstorming** and **SCAMPER**. In *brainstorming* the designer rapidly lists every idea that comes to mind — words and quick images — without stopping to criticise any of them; because judgement is suspended, unlikely ideas are kept on the page and often trigger further ideas, so the range stays wide. In *SCAMPER* the designer takes an existing idea and deliberately prompts variations by asking how it could be *Substituted, Combined, Adapted, Modified, Put to another use, Eliminated or Reversed*; each prompt forces a fresh direction the designer might not have reached otherwise, multiplying the options. Both work by favouring *quantity and variety* over early judgement, which is the purpose of divergent thinking (4 marks: two strategies described + how each widens the pool of ideas).

Practice questions

Scaffolded

Q1. Design thinking involves two kinds of thinking. (a) Define divergent thinking. (1 mark) (b) Define convergent thinking. (1 mark) (c) State one strategy a designer would use for each. (2 marks)

Q2. Using the NEST mind-map: (a) Name the divergent strategy shown. (1 mark) (b) Identify two different idea directions the designer has generated. (2 marks) (c) Explain why suspending judgement is important at this stage. (2 marks)

Q3. A designer uses a PMI to evaluate an idea. (a) State what P, M and I stand for. (1 mark) (b) State whether a PMI is a divergent or a convergent strategy. (1 mark) (c) Explain why each point in a PMI should be tied to the design criteria. (2 marks)

Q4. The VCD design process has four phases. (a) Name the four phases in order. (2 marks) (b) State whether Discover and Develop mainly use divergent or convergent thinking, and why. (2 marks)

Q5. Distinguish between a design **idea** and a design **concept**, and link each to a kind of thinking. (3 marks)

Q6. Convergent thinking is used to select between options. (a) Name one convergent strategy other than PMI. (1 mark) (b) Describe how a designer would use it to choose between two concepts. (2 marks)

Unscaffolded

Questions 7–16 refer to the following design problem.

A coastal council is developing **TIDE POOLS**, a self-guided rockpool discovery trail along a foreshore. It needs a visual identity and a set of weatherproof trail markers. The audience is **families with young children**. The **design**

criteria are: (1) appeal to young children and their parents; (2) remain legible outdoors at 3 m in bright sunlight; (3) reproduce in **two colours** on recycled marker board; and (4) reflect the coastal, rockpool setting.

Q7. A student evaluates a TIDE POOLS identity idea — a starfish-and-ripple wordmark — with this PMI: **Plus** — “the design uses the colours blue and orange”; **Minus** — “the lines are thin”; **Interesting** — “the markers have to be legible at 3 m in bright sunlight”. Explain why none of these three points would earn marks, then rewrite each one so that it evaluates the idea against a stated TIDE POOLS design criterion. (4 marks)

Q8. Using a **SWOT** analysis, evaluate a proposed trail-marker concept for TIDE POOLS and recommend whether to proceed, referring to the design criteria. (6 marks)

Q9. Produce a **mind-map** to generate ideas for the TIDE POOLS identity. Show the central problem, at least **four** labelled branches and **two** ideas on each branch, and name the phase of the VCD design process this work belongs to. (4 marks)

Q10. A PMI and a SWOT are both convergent thinking strategies. Distinguish between them, and justify which one you would use to evaluate the single **resolved** TIDE POOLS trail-marker concept before it is presented to the council. (4 marks)

Q11. In a Section B task a student is asked to generate at least three diverse ideas for the TIDE POOLS markers using **development drawings**. The student submits a brainstorm list and a mind-map instead. Explain why this response would score poorly, and state where each of these two strategies *does* belong in the design process. (4 marks)

Q12. A student writes that “convergent thinking just means picking your favourite idea.” Explain why this is incorrect. (3 marks)

Q13. A designer’s brainstorm for the TIDE POOLS markers produces three ideas: a starfish marker, a starfish marker in two colours, and a starfish marker with a wave border. Explain why this is weak divergent thinking, and describe one genuinely different direction the designer could add. (3 marks)

Q14. Explain how a designer uses **feedback** together with the design criteria when converging on one of three TIDE POOLS trail-marker concepts, and state one reason feedback makes the decision more reliable. (3 marks)

Q15. “How might we make the trail markers feel like a treasure hunt?” (a) Identify which kind of thinking this question supports. (1 mark) (b) Apply **SCAMPER** to generate two variations of a starfish trail-marker idea. (3 marks)

Q16. Discuss how a designer uses **both** divergent and convergent thinking to move from many ideas to one resolved solution for the TIDE POOLS trail, naming at least one strategy for each kind of thinking. (6 marks)

Answers

Q1. (a) Open-minded, imaginative thinking that suspends judgement to generate many possibilities. (b) Analytical, critical, comparative thinking that summarises/synthesises to select and refine. (c) Divergent e.g. brainstorming; convergent e.g. PMI. **Q2.** (a) Mind-mapping. (b) Any two branches, e.g. imagery (twig nest) and colour (bright pop). (c) See solutions. **Q3.** (a) Plus, Minus, Interesting. (b) Convergent. (c) See solutions. **Q4.** (a) Discover, Define, Develop, Deliver. (b) Both divergent — they search widely / generate many ideas. **Q5.** Idea = a rough, rapidly generated option (divergent); concept = a selected, refined option (convergent). **Q6.** (a) A SWOT analysis (also accept an evaluation / decision matrix or dot-voting). (b) See solutions. **Q7–Q16.** See fully-worked solutions.

Fully-worked solutions

Q1. (a) **Divergent thinking** is open-minded, curious and imaginative; it suspends judgement and focuses on the many possible ways a problem might be solved. (b) **Convergent thinking** is analytical, critical and comparative; it summarises, categorises and synthesises information to clarify or resolve a problem and to select and refine the best option. (c) Divergent, e.g. brainstorming or mind-mapping; convergent, e.g. a PMI or SWOT (2 marks: one correct strategy in each mode).

Q2. (a) **Mind-mapping.** (b) Any two distinct branches, e.g. an *imagery* direction (a twig “nest” motif) and a *colour* direction (a bright pop palette). (c) Suspending judgement keeps ideas flowing: if the designer stops to criticise each idea, weaker-looking options are discarded before they can spark better ones, and the range of possibilities collapses. Holding judgement back is what makes the map *divergent* and maximises quantity at this stage (2 marks).

Q3. (a) **Plus, Minus, Interesting.** (b) **Convergent.** (c) Tying each point to the design criteria keeps the evaluation objective and relevant: a “plus” only counts if it meets a stated criterion (e.g. legibility at 3 m), and a “minus” is a genuine failure against a criterion rather than a personal dislike. This is what turns a PMI into evidence for a decision and is what Section B rewards (2 marks: *objectivity + relevance to the brief*).

Q4. (a) **Discover, Define, Develop, Deliver.** (b) Both **Discover** and **Develop** mainly use **divergent** thinking: in Discover the designer searches widely and suspends judgement to gather insights, and in Develop the designer generates a broad range of imaginative ideas — both phases *open up* possibilities before the intervening Define and following Deliver phases converge on decisions (2 marks).

Q5. A design **idea** is a rough, rapidly generated, experimental option produced by **divergent** thinking, when the aim is a broad range of possibilities. A design **concept** is an idea that has been **selected and refined** through **convergent** thinking — evaluated against the brief and developed further, with more resolved detail. So ideas come first and are many; concepts are fewer and more considered (3 marks: *idea vs concept + the matching thinking mode for each*).

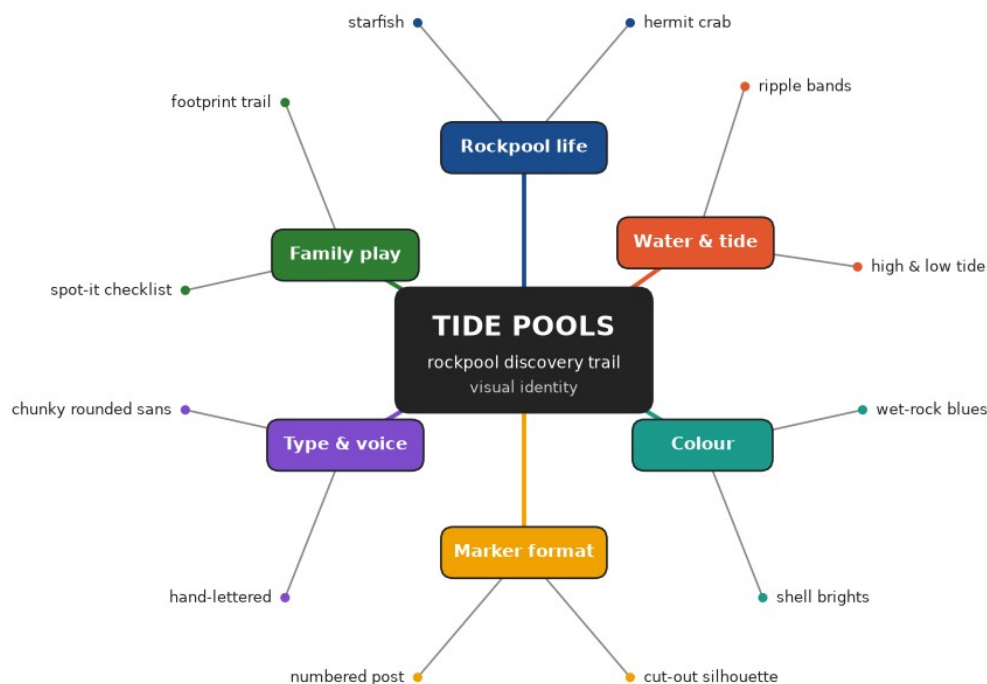
Q6. (a) A **SWOT** analysis (also accept an evaluation / decision matrix or dot-voting). (b) The designer runs a SWOT on each of the two concepts, tying every point to a design criterion — strengths and weaknesses are internal to the concept, opportunities and threats are external conditions it will meet — then compares the two completed analyses side by side and selects the concept whose strengths satisfy more of the criteria and whose weaknesses are the more easily fixed. The decision is evidence-based rather than a preference (2 marks: *uses the criteria to compare and select*).

Q7. None of the three points **evaluates** the idea. The Plus and the Minus only *describe* what is on the page — which colours were used, how thick the lines are — and the “Interesting” point simply *repeats a design criterion* without saying anything about how this idea meets it. A PMI point earns marks only when it names a feature of the idea, states which criterion that feature satisfies or fails, and says to what extent. *Model rewrites.* **Plus:** the warm orange reads as bright and playful against the cool blue, and that contrast is what makes the mark catch a young child’s eye (criterion 1); the two flat colours also print within the two-colour limit of the recycled marker board (criterion 3). **Minus:** the ripple lines are about 0.5 mm at final size, so they close up and grey out at 3 m in bright sun — as drawn, the idea fails criterion 2. **Interesting:** cutting the starfish *through* the board so it reads as a shape against the sky, rather than as printed line, could restore legibility at 3 m while strengthening the rockpool reference (criteria 2 and 4) — worth testing (4 marks: *the fault identified as descriptive / criteria-restating rather than evaluative + three points rewritten, each tied to a named criterion*).

Q8. (*Model, evaluating a “rockpool window” trail-marker concept — a marker shaped like a peep-hole into a pool.*) **Strengths:** the peep-hole shape is playful and clearly signals “look here”, appealing to children and reflecting the

rockpool setting (criteria 1, 4); a bold shape reads at 3 m (criterion 2). **Weaknesses:** the detailed creatures inside the “window” may not reproduce in only two colours on recycled board (criterion 3). **Opportunities:** the repeated peep-hole shape could build a recognisable trail system and extend to an app or booklet. **Threats:** weathering and salt could fade fine detail outdoors over time. **Recommendation:** proceed, because the concept meets criteria 1, 2 and 4 strongly; but first simplify the internal imagery to two flat colours so it also satisfies criterion 3 and survives weathering (6 marks: four SWOT quadrants tied to criteria + a justified recommendation).

Q9. (Model.) The mind-map below begins from the central problem — the TIDE POOLS identity — and branches outward into six directions, with two ideas on each branch and nothing judged or ruled out yet.



Model answer (Q9) — a mind-map opening up the TIDE POOLS identity in the Develop phase

Written out, the branches are: *Rockpool life* — starfish, hermit crab; *Water and tide* — ripple bands, high and low tide; *Colour* — wet-rock blues, shell brights; *Marker format* — cut-out silhouette, numbered post; *Type and voice* — hand-lettered, chunky rounded sans; *Family play* — spot-it checklist, footprint trail. Four branches would satisfy the question; six shows a wider search. This work belongs to the **Develop** phase of the VCD design process, where the designer thinks divergently and generates a broad range of imaginative ideas (4 marks: a central problem + at least four labelled branches + two distinct ideas on each + the Develop phase named).

Q10. A PMI evaluates **one** idea from three angles — what works, what does not and what is worth exploring — and every point looks inward at the idea itself. A **SWOT** also examines a single concept, but splits the analysis in two: **strengths and weaknesses** are internal to the design, while **opportunities and threats** are external conditions the design will meet once it exists. A PMI is therefore the faster three-part check on one idea; a SWOT is the wider one, because half of it reaches outside the design. For the resolved TIDE POOLS marker a **SWOT** is the better choice. The marker has to survive a foreshore — salt, weathering, glare, possible damage — and the council may later extend the trail or produce a booklet from the same identity; those threats and opportunities have no place in a PMI but are exactly what the council needs weighed before it approves the design, alongside the four criteria. (Accept a justified PMI: the concept is a single resolved idea and a PMI checks it quickly against each criterion in turn — provided every point is tied to a criterion.) (4 marks: the two strategies distinguished + a choice justified against the project and its criteria).

Q11. The question asks for at least three diverse ideas generated **as development drawings**, and a brainstorm list and a mind-map are neither — they are written, verbal strategies. Both are legitimate divergent strategies, and both may well have produced the ideas, but submitting them *in place of* drawings does not meet the requirement of the question, so it limits the marks that can be awarded; assessors report exactly this outcome for responses that included brainstorms or mind maps instead of developmental drawings. A written list also leaves the ideas unresolved visually — nobody can see what any marker would actually look like, which is what the Develop phase exists to establish.

Where they do belong: the brainstorm and the mind-map come **before** the drawing, at the opening of the **Develop** phase, where the designer uses them to open up directions (and the same wide, judgement-free searching belongs earlier still, in **Discover**). The student should then have taken the directions the map produced and **drawn** at least three diverse ideas from them (4 marks: *the drawing requirement not met + a written strategy is not a drawing + correct placement of both strategies*).

Q12. The statement is incorrect because convergent thinking is **analytical and criteria-based**, not a matter of preference. The designer summarises and compares the options against the **design criteria** and feedback — using a convergent strategy such as a PMI or a SWOT — and selects the idea that best meets the brief, giving reasons. “Picking your favourite” ignores the criteria and the evidence, so it produces exactly the generalised, non-evaluative kind of response that earns few marks; assessors report that the responses that score link every point in a PMI or SWOT explicitly to a design criterion and explain how a specific feature of the concept satisfies it (3 marks: *convergent = evidence/criteria-based selection, not taste*).

Q13. All three “ideas” are the same idea — a starfish marker — with cosmetic changes to colour and edging. Divergent thinking aims at *quantity and range*: a broad set of genuinely different directions the designer can later choose between. Three minor variations of one idea leave the designer with only one real option, so the convergent stage that follows has nothing to compare; assessors report that sets of this kind show limited exploration and no breadth of thinking. A genuinely different direction would change the idea itself rather than its finish — for example a tide-chart band that marks how far the water reaches at each pool, a set of cast footprints leading the walker from one pool to the next, or a hand-lettered numbered post carrying no creature imagery at all (3 marks: *minor variations are not distinct ideas + why range matters + one genuinely different direction*).

Q14. Once the three concepts exist, the designer presents them for critique — to peers, to the client (the council) and to people like the intended audience, families with young children — and asks targeted questions: which marker is spotted first from a distance, which creature children name correctly, which looks like it belongs on the foreshore. That feedback is then used **inside** the convergent strategy rather than beside it: each PMI or SWOT point cites both the criterion it addresses and what the testing showed, so “legible at 3 m in bright sunlight” (criterion 2) becomes a finding rather than an opinion, and the concept selected for refinement is the one the evidence supports. Feedback makes the decision more reliable because the designer already knows what the marker is *meant* to say and cannot unknown it; only someone outside the process can show whether it actually communicates, which takes the designer’s own familiarity and preference out of the choice (3 marks: *feedback gathered from others + used with the criteria inside the convergent strategy + a reason it makes the decision more reliable*).

Q15. (a) **Divergent** thinking — a “how might we...” question reframes the problem as an open invitation and prompts many possible ideas. (b) Applying **SCAMPER** to a starfish trail-marker: *Combine* — merge the starfish with a number so each marker is also a trail step (“stop 3”); *Modify* — enlarge one arm into a pointing finger so the starfish also shows the walking direction. (Accept other valid SCAMPER prompts, e.g. *Substitute* a crab for the starfish, *Reverse* the figure-ground so the starfish is cut out of the board.) (3 marks: *two genuine SCAMPER variations, each naming the prompt used*).

Q16. The designer uses the two kinds of thinking in turn to move from many ideas to one solution. First, **divergent** thinking opens the problem up: through **brainstorming** and **mind-mapping** the designer rapidly generates a wide range of imaginative TIDE POOLS ideas — waves, shells, starfish, tide charts — suspending judgement to keep the range broad and favouring quantity. Then **convergent** thinking closes in: using a **PMI** or **SWOT** (and feedback), the designer evaluates the ideas point-by-point against the four design criteria, summarising and comparing them to select the concept with the most potential. The chosen concept is refined — simplified for two-colour printing and thickened for legibility at 3 m — until it is a resolved solution. Neither kind of thinking alone is enough: divergent thinking without convergent thinking produces many ideas but no decision, while convergent thinking without divergent thinking has too few ideas to choose from. The designer therefore alternates between opening up and focusing in (6 marks: *both modes named and applied, at least one strategy each, tied to the criteria, showing the movement from many ideas to one solution*).

Chapter 1 The VCD design process and design thinking — 1C Design ideas, concepts and solutions

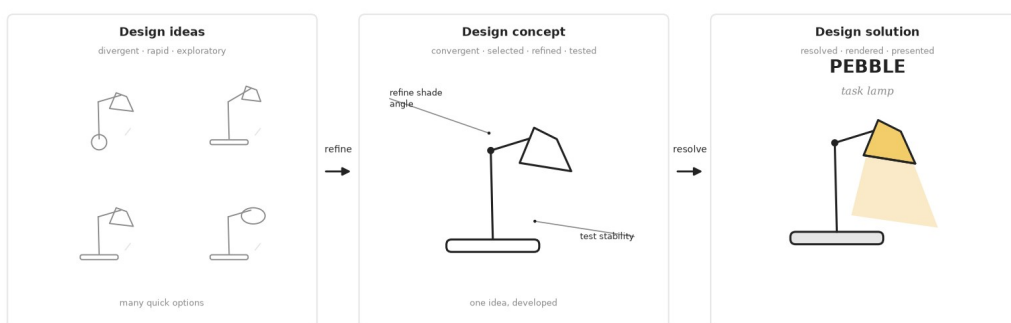
Theory

As a designer works through the **VCD design process**, the work they produce becomes steadily more resolved. The Study Design names three levels of resolution: **design ideas**, **design concepts** and **design solutions**. These terms describe *how far a piece of work has been developed* — not what it looks like or which field it belongs to. Being able to name the level, and to name the *purpose* of a drawing, is examinable knowledge that also underpins the practical task in Section B.

Design ideas — divergent, rapid, exploratory. In the early stages of the *Develop* phase the designer uses **divergent thinking** to generate a broad range of imaginative options. Drawings and prototypes are *experimental, imaginative and rapidly generated* in an effort to capture the essence of emerging ideas. The designer aims for many options rather than a single “right” answer, freely combining the design elements and principles while keeping the audience or users and the earlier research in mind. Judgement is suspended; quantity and variety matter more than finish.

Design concepts — convergent, selected, refined, tested. The designer then switches to **convergent thinking** to reflect critically on the ideas. Each idea is evaluated against the specified problem and the design criteria, and feedback is used to *select the ideas with the greatest potential for further refinement*. Decisions about the design elements and principles, and about combinations of methods, media and materials, now become considered and purposeful, resolving details and unifying aesthetic qualities. Development and documentation drawings visualise, refine, test and evaluate the concept, and may be rendered to depict surfaces and finishes; **low-fidelity prototypes** may also be made for testing and critique. A key exam point: a designer develops **one idea into two (or more) concepts** — not two separate ideas.

Design solutions — resolved, presented. Finally the designer *proposes a resolved solution using appropriate presentation formats*. A solution may be presented through documentation drawings, models, concept boards, mock-ups or **high-fidelity prototypes**, and may be *accompanied by* a written rationale — the rationale accompanies the presentation; it is not itself a presentation format. Keep the **format** (the vehicle the solution is delivered in) separate from the **presentation drawings** that vehicle carries: a concept board is a format, and a rendered impression mounted on it is a drawing. The Study Design notes that *the manufacture of functional prototypes is not a requirement of this study* — you propose and present a solution rather than build a working product, so even a high-fidelity prototype need not have functioning components.



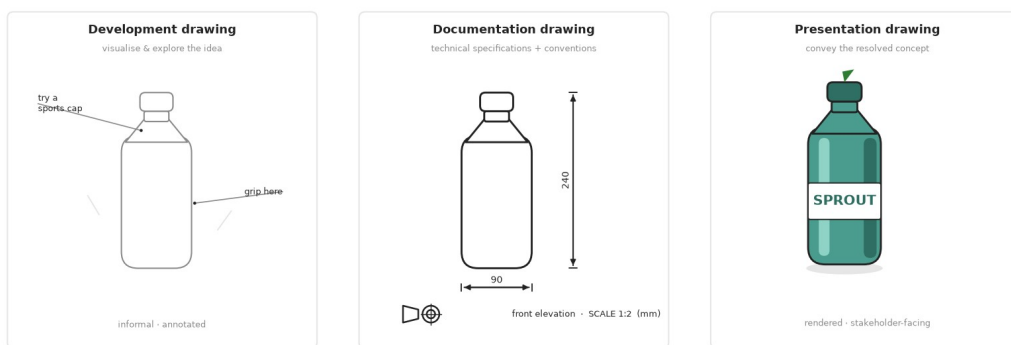
The original *PEBBLE* task lamp above shows the progression: many rapid idea sketches (left) are narrowed to one refined, annotated concept (centre), which is resolved and rendered as a presented solution (right).

Watch-out — idea ≠ concept ≠ solution. These name *levels of resolution*, not quality. An idea is one of many rapid, divergent options; a concept is a *selected* idea refined and tested against the criteria; a solution is the *resolved* proposal, presented. Do not call a rough sketch a “solution” because it is neat, or a concept an “idea” because it is on paper.

Watch-out — one idea, two concepts. In Section B you develop **one** design idea into **two** concepts (variations of the same idea), not two unrelated ideas. Confusing these loses marks.

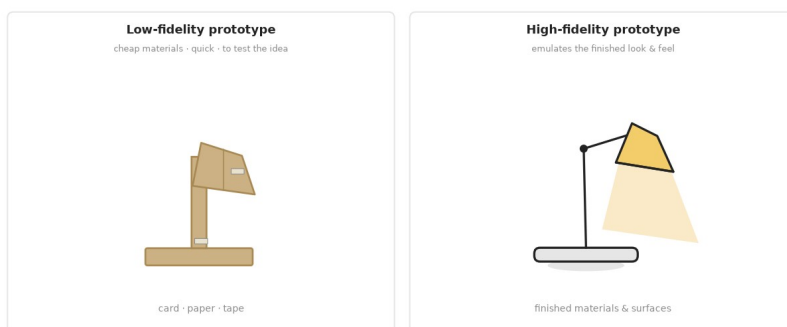
The three purposes of drawing. Drawing is a **method** used at every phase of the process, and the Study Design classifies drawings by their **purpose** — what job the drawing does. The same object can be drawn for all three purposes.

- **Development drawings** *visualise design ideas and concepts* so they can be analysed, tested and evaluated. They are used in **both** the *Develop* and *Deliver* stages, may be rapid and informal or refined for critique, and may be rendered. They include, but are not limited to, **ideation sketches, schematic diagrams, storyboards, mock-ups and illustrations.**
- **Documentation drawings** *define and record the technical specifications required for the assembly* of three-dimensional objects and environments. They may represent form in two dimensions (**orthogonal drawings, architectural plans and elevations, packaging nets, technical flats**) or in three dimensions (**perspective and paraline — isometric and planometric — drawings**). They include **technical conventions such as symbols, dimensions and scales.**
- **Presentation drawings** *convey resolved design concepts to stakeholders* for consideration. They include, but are not limited to, **rendered impressions** of buildings, environments or objects, illustrations, documentation drawings and storyboards, and can form part of **mock-ups, concept boards or style guides.**



Watch-out — the drawing purposes are easily confused. Classify a drawing by its **purpose**, not by its subject or how tidy it is. A development drawing explores an idea; a documentation drawing carries conventions (dimensions, scale, symbols) for assembly; a presentation drawing sells a resolved concept to a stakeholder. Note that categories can overlap in *use* — a documentation drawing may appear inside a presentation — but the **purpose** is what you name.

Prototyping — low- and high-fidelity. Prototyping is a **method** of making a test version of a design so the idea can be tried out and critiqued — usually a three-dimensional model of an object or environment, but for an interactive experience a static version of the interface. **Low-fidelity** prototyping uses *inexpensive and readily available materials, together with efficient methods, to construct and test design ideas* — think folded card, paper and tape, made quickly to try an idea out early. **High-fidelity** prototyping uses *materials and techniques to emulate the look and feel of a finished product, and may or may not include functioning components*. Low-fidelity sits with ideas and concepts (fast, cheap testing and critique); high-fidelity sits with the presented solution.



Watch-out — fidelity is resemblance, not quality. “Fidelity” means how closely the prototype *emulates the finished product*, not how good it is. A neat low-fidelity model is still low-fidelity if it is made from cheap stand-in materials.

Method, media and material are three different things. *Methods* are the manual or digital processes used — drawing, collage, printing, photography, model-making, prototyping. *Media* are the applications used to make marks — pencil, ink, markers, or software and apps (Adobe Illustrator is a **medium**, not a method). *Materials* are the surfaces or substrates — paper, card, textile, metal, touchscreen. The drawing *purposes* above are a further classification **within** the drawing method.

Watch-out — evaluate methods, media and materials in the FINAL solution. When a question asks you to evaluate the methods, media and materials, judge what is visible in the *resolved solution*, not the ideation sketches, and distinguish **digital** from **manual**. Ideation choices are not what is being assessed.

The how-to of each drawing method — constructing orthogonal, isometric, planometric and perspective drawings, and rendering — is taught in Chapters 4 and 5. This subtopic defines the **categories** so you can name and choose the right one.

Worked examples

Example 1 — scaffolded

With reference to the PEBBLE task lamp, distinguish between a design idea and a design concept. (4 marks)

Working	Comment
A design idea is one of many rapid, divergent options generated early in the <i>Develop</i> phase — such as the loose thumbnail sketches of alternative lamp forms on the left.	Define the first term with the SD language (divergent, rapid, many options).
A design concept is an idea that has been <i>selected</i> for its potential and <i>refined</i> — the single annotated lamp in the centre, developed after evaluating the ideas against the criteria and feedback.	Define the second term (convergent, selected, refined, tested).
The idea is exploratory and unresolved; the concept makes considered, purposeful decisions about elements, principles and methods, media and materials to resolve details.	Draw the <i>distinction</i> explicitly — both sides, not one.
So the difference is level of resolution and thinking : divergent exploration (idea) versus convergent selection and refinement (concept).	Close on the key contrast to secure the “distinguish” marks.

Example 2 — scaffolded

The three drawings of the SPROUT bottle above show the same object drawn for different purposes. Identify the purpose of each and describe how you can tell. (6 marks)

Working	Comment
The left drawing is a development drawing : a loose, annotated ideation sketch used to visualise and explore the form.	Identify + one telling feature (informal, annotated, exploratory).
The centre drawing is a documentation drawing : an orthogonal elevation carrying dimensions, a scale and the third-angle projection symbol — technical conventions for assembly.	The conventions (dimensions/scale/symbol) are the give-away for documentation.
The right drawing is a presentation drawing : a rendered impression showing surface, light and shade, presented with the brand name to convey the resolved concept to a stakeholder.	Rendering + stakeholder-facing presentation identify it.
Each is classified by its purpose , not its subject — the same bottle serves development, documentation and presentation.	State the classifying principle to lock the marks.

Example 3 — unscaffolded

Explain why a designer would make a low-fidelity prototype before a high-fidelity prototype. (4 marks)

A low-fidelity prototype is made from inexpensive, readily available materials using efficient methods, so it is quick and cheap to produce. This lets the designer construct and test a design **idea** early — checking scale, proportion and how it is handled — and gather feedback and critique before committing time or resources. Because it costs little, several versions can be tried and changed rapidly. A high-fidelity prototype, by contrast, uses materials and techniques that emulate the look and feel of the finished product and takes far more effort, so it is reserved for a **resolved** concept once the idea has been tested. Making the low-fidelity prototype first therefore reduces wasted effort and improves the concept before the expensive, finished-looking version is built (*cause-and-effect chain: cheap/fast → test and iterate early → commit resources only to a proven concept*).

Example 4 — unscaffolded

A student writes: “You can evaluate a design’s methods, media and materials from the designer’s first idea sketches.” Evaluate this statement. (4 marks)

The statement is **incorrect**. Methods, media and materials should be evaluated in the **final, resolved solution**, because that is where the designer has made considered, purposeful choices — the drawing or making method used, the media (for example manual pencil rendering versus digital software), and the material or substrate of the presented outcome. Early idea sketches are rapid, experimental and divergent; their media and materials are chosen for speed, not to communicate the finished design, so they do not show the resolved decisions the question is really testing. The only accurate part of the statement is that methods, media and materials *are* used throughout the process; but to **evaluate** them you must judge what is visible in the final solution and distinguish digital from manual choices (*judgement + reason grounded in “final solution” + the one correct qualification*).

Practice questions

Scaffolded

- Q1.** Using the three PEBBLE task lamp panels: (a) Name, in order, the three levels of resolution shown from left to right. (1 mark) (b) State which type of thinking a designer uses to generate the ideas on the left. (1 mark) (c) Describe one way the concept (centre) differs from the ideas (left). (2 marks)
- Q2.** Using the three drawings of the SPROUT bottle: (a) Identify the drawing purpose of each of the three drawings. (3 marks) (b) Which drawing includes technical conventions such as dimensions and scale? (1 mark) (c) Describe one feature that shows the left drawing is a development drawing. (2 marks)
- Q3.** Using the two PEBBLE lamp prototypes: (a) Identify which is the low-fidelity prototype and which is the high-fidelity prototype. (1 mark) (b) Define low-fidelity prototyping. (2 marks) (c) Explain one reason a designer would test with a low-fidelity prototype. (2 marks)
- Q4.** Distinguish between **divergent** and **convergent** thinking, and state which is used to generate design ideas. (3 marks)
- Q5.** A designer is ready to present a resolved design solution to a client. Name **three** presentation formats they could use. (3 marks)
- Q6.** Explain why the **purpose** of a drawing, rather than its subject, determines whether it is a development, documentation or presentation drawing. (3 marks)

Unscaffolded

- Q7.** Distinguish between a **development drawing** and a **documentation drawing**, referring to the purpose of each and giving one example type of each. (4 marks)
- Q8.** Explain how a single design **idea** is developed into two design **concepts**. (3 marks)
- Q9.** Development drawings are used in **both** the *Develop* and *Deliver* stages of the design process. Explain why. (3 marks)

Q10. Describe **two** things a designer does when refining a design idea into a design concept. (2 marks)

Q11. Explain the difference between **low-fidelity** and **high-fidelity** prototyping. In your answer, refer to the materials used and whether functioning components are required. (4 marks)

Q12. A design solution is to be presented to a client on a **concept board** (itself a presentation format). Identify **one** type of presentation drawing that could be placed on the board and explain why it is suited to presenting a resolved solution. (3 marks)

Q13. Classify each of the following as a development, documentation or presentation drawing, giving a reason for each: (i) a storyboard exploring the screens of a new app; (ii) an orthogonal drawing of a chair with dimensions and a scale; (iii) a rendered impression of a café interior mounted on a concept board. (6 marks)

Q14. Explain why design ideas are generated using **divergent thinking** and rapid drawing and making methods. (3 marks)

Q15. Compare a design **concept** with a design **solution**, referring to level of resolution and how each is presented. (4 marks)

Q16. A studio is designing *GLIDE*, an original foldable commuter scooter. In their process they produce: (i) twenty quick thumbnail sketches of possible forms; (ii) two refined, rendered versions that they test with commuters using taped-cardboard models; (iii) a final isometric drawing with dimensions plus a rendered impression on a concept board. For each of (i), (ii) and (iii), name the level of resolution (idea, concept or solution) and the drawing purpose or prototype fidelity involved, and justify your answer. (6 marks)

Q17. The Study Design states that “the manufacture of functional prototypes is not a requirement of this study”. Explain what this means for how a student presents a design solution. (2 marks)

Answers

Q1. (a) Design ideas → design concept → design solution. (b) Divergent thinking. (c) See solutions (selected/refined/considered vs rapid/exploratory). **Q2.** (a) Left = development, centre = documentation, right = presentation. (b) The centre drawing (documentation). (c) See solutions (loose, annotated, exploratory sketch). **Q3.** (a) Left = low-fidelity; right = high-fidelity. (b) Inexpensive, readily available materials + efficient methods to construct and test design ideas. (c) See solutions. **Q4.** Divergent = generating many options widely (used for ideas); convergent = narrowing/selecting/evaluating. Divergent generates ideas. **Q5.** Any three of: documentation drawings, models, concept boards, mock-ups, high-fidelity prototypes. (A written rationale *accompanies* a presentation — it is not itself a presentation format.) **Q6.** See solutions — the same subject can be drawn for any of the three purposes; the job the drawing does classifies it. **Q7.** Development = visualise/explore ideas & concepts (e.g. ideation sketch); documentation = technical specs for assembly with conventions (e.g. orthogonal drawing). See solutions. **Q8.** Select one idea with the most potential, then refine it into two variations, testing/evaluating each against the criteria. See solutions. **Q9.** Development drawings both explore ideas (Develop) and refine/test the selected concept (Deliver). See solutions. **Q10.** Any two: evaluate against the criteria; use feedback; select the strongest idea; make purposeful element/principle decisions; choose methods, media and materials; resolve details; unify the aesthetic. **Q11.** Low-fi = cheap stand-in materials/efficient methods to test ideas; high-fi = materials/techniques emulating the finished look and feel, may or may not function. See solutions. **Q12.** e.g. a rendered impression (accept an illustration, a documentation drawing or a storyboard); it conveys the resolved concept to the stakeholder. See solutions. **Q13.** (i) development (explores/visualises the app's flow); (ii) documentation (conventions for assembly); (iii) presentation (rendered, stakeholder-facing on a concept board). **Q14.** To produce a broad range of imaginative options quickly, suspending judgement and capturing the essence of emerging ideas. See solutions. **Q15.** Concept = selected/refined idea being tested; solution = resolved proposal presented in appropriate formats. See solutions. **Q16.** (i) ideas / development (ideation) sketches; (ii) concepts / low-fidelity prototypes (+ rendered development drawings); (iii) solution / documentation + presentation drawings. See solutions. **Q17.** Students present (not manufacture) the solution — e.g. documentation drawings, models, concept boards, mock-ups or high-fidelity prototypes. See solutions.

Fully-worked solutions

Q1. (a) From left to right: **design ideas**, then a **design concept**, then a **design solution**. (b) **Divergent thinking**. (c) The ideas are rapid, experimental and exploratory — many options generated without judgement — whereas the concept is a *selected* idea that has been refined through considered, purposeful decisions and tested against the criteria and feedback (2 marks: a clear point of difference on both sides).

Q2. (a) Left = **development drawing**; centre = **documentation drawing**; right = **presentation drawing**. (b) The **centre** drawing, the documentation drawing. (c) It is a loose, informal sketch with annotations that explores and visualises the form of the bottle, rather than recording technical specifications or presenting a finished impression — the marks of a development drawing (2 marks).

Q3. (a) The left (paper/card, blocky) model is the **low-fidelity** prototype; the right (finished- looking, rendered) model is the **high-fidelity** prototype. (b) Low-fidelity prototyping uses inexpensive and readily available materials, together with efficient methods, to construct and test design ideas (2 marks). (c) Because it is quick and cheap, the designer can test an idea early — its scale, proportion and how it is handled — and gather feedback to improve the design before committing resources to a finished version (2 marks).

Q4. **Divergent thinking** searches widely for many new possibilities, suspending judgement to generate a broad range of options; **convergent thinking** narrows this down — reviewing, evaluating and selecting the strongest options against the criteria. Design **ideas** are generated using **divergent** thinking (3 marks: both defined + correct attribution).

Q5. Any three of: **documentation drawings, models, concept boards, mock-ups or high-fidelity prototypes** (3 marks: one each). A **written rationale** may *accompany* the presentation, but the Study Design does not list it as a presentation format, so it earns no mark here.

Q6. A drawing is classified by the **job it does**, because the same subject can be drawn for any of the three purposes: a bottle can be sketched to explore an idea (development), drawn in orthogonal projection with dimensions for assembly (documentation), or rendered on a concept board to persuade a client (presentation). The subject is identical in each case, so only the purpose — visualising, recording specifications, or presenting to a stakeholder — can tell them apart (3 marks: principle + example of the same subject across purposes).

Q7. A **development drawing** is used to *visualise and explore* design ideas and concepts so they can be analysed, tested and evaluated — for example an **ideation sketch** or storyboard. A **documentation drawing** *defines and records the technical specifications required for assembly* of a three-dimensional object or environment, and includes conventions such as dimensions, scales and symbols — for example an **orthogonal drawing** or packaging net. The key distinction is purpose: exploring an idea versus recording specifications for making (4 marks: purpose of each + one example type each).

Q8. The designer first uses convergent thinking to **select the single idea with the greatest potential**, judged against the design criteria and feedback. They then **develop that one idea into two concepts** — two refined variations of the same idea — exploring different combinations of design elements and principles, and methods, media and materials, and annotating each to evaluate it against the brief. The two concepts share the same underlying idea but resolve it in different ways (3 marks: select one idea → refine into two variations → evaluate against criteria).

Q9. Development drawings appear in the **Develop** stage to generate and explore imaginative design ideas, and again in the **Deliver** stage to refine, test and evaluate the *selected concept* before it is resolved. Because their purpose — visualising ideas and concepts so they can be analysed and evaluated — is needed both while exploring widely and while refining the chosen direction, the same category of drawing serves both stages (3 marks).

Q10. Any two of: evaluating the ideas against the specified problem and design criteria; drawing on **feedback**; **selecting** the idea with the most potential; making **considered, purposeful decisions** about the design elements and principles; choosing combinations of **methods, media and materials**; resolving details; and unifying the aesthetic qualities (2 marks: any two).

Q11. **Low-fidelity** prototyping uses **inexpensive and readily available materials** (such as paper, card and tape) with efficient methods, to construct and test design ideas quickly and cheaply. **High-fidelity** prototyping uses **materials and techniques that emulate the look and feel of a finished product**, and **may or may not include functioning components**. So the difference is in resemblance to the finished product and in cost: low-fidelity is a fast stand-in for testing an idea, while high-fidelity closely imitates the resolved outcome, whether or not it actually works (4 marks: materials of each + the functioning-components point + the resemblance distinction).

Q12. A **rendered impression** of the object or environment could be placed on the board (accept an **illustration**, a **documentation drawing** or a **storyboard** — the presentation drawings the Study Design names). It is suited to presenting a resolved solution because it shows surface, light and shade in a persuasive, finished-looking form, so the client can picture the outcome and give approval — exactly the purpose of a presentation drawing: to convey a resolved concept to a stakeholder for consideration. Note the distinction the question turns on: the **concept board** is the presentation *format*; the rendered impression is a presentation *drawing* that the board carries (3 marks: named type of presentation drawing + reason tied to presenting a resolved solution).

Q13. (i) **Development drawing** — a storyboard *visualises and explores* the flow of the app's screens as an idea/concept. (ii) **Documentation drawing** — the orthogonal drawing carries technical conventions (dimensions, scale) to *record specifications for assembly*. (iii) **Presentation drawing** — a *rendered* impression on a concept board *conveys the resolved concept to a stakeholder* (6 marks: correct category + valid reason for each).

Q14. Design ideas are generated with **divergent thinking** and rapid methods so the designer can produce a **broad range of imaginative options** without stopping to judge them. Working quickly and experimentally lets them explore many possibilities and *capture the essence of emerging ideas* while keeping the audience and research in mind, increasing the chance that a strong direction is found before narrowing down (3 marks: broad range + suspend judgement/rapid + capture emerging ideas).

Q15. A design **concept** is a *selected idea that has been refined* and is still being tested, iterated and evaluated against the criteria — typically communicated through development and documentation drawings, and low-fidelity prototypes. A design **solution** is the **resolved** proposal, presented using appropriate presentation formats such as documentation drawings, models, concept boards, mock-ups or high-fidelity prototypes, possibly accompanied by a written rationale. The concept is *less resolved* and still under test; the solution is *fully resolved* and presented for approval (4 marks: resolution + presentation for each, drawn as a comparison).

Q16. (i) These are design **ideas**, produced as **ideation (development) sketches** — twenty rapid, divergent thumbnails exploring possible forms. (ii) These are design **concepts**: one idea refined into two rendered development drawings, tested with users via **low-fidelity prototypes** (taped-cardboard models made from cheap materials for critique). (iii)

This is the design **solution**: an isometric **documentation drawing** with dimensions plus a **presentation drawing** (rendered impression) on a concept board, presenting the resolved outcome to stakeholders *(6 marks: correct level + correct purpose/fidelity + justification for each of the three)*.

Q17. It means a student is required only to **present** a resolved solution, not to build a working, manufactured product. The solution can therefore be communicated through documentation drawings, models, concept boards, mock-ups or high-fidelity prototypes (which need not function), accompanied if wished by a written rationale *(2 marks: present not manufacture + valid presentation formats)*.