THE STRIVING

MUSLIM ACADEMY

Islamic and Academic Education

YEARS 7 TO 9 · DESIGN AND TECHNOLOGY

Design and make

Finding the problem, specifying it, modelling it, building it and judging it, for Years 7 to 9.

WHAT IS INSIDE

- From a problem to a specification
- Generating ideas without repeating yourself
- Drawings and models that carry decisions
- Materials, structures and working precisely
- Systems: mechanical, electrical, and intelligent
- Consequences, and the designer's responsibility
- Task 1: Specification, written before anything else
- Task 2: Ten ideas, then one developed properly
- Task 3: Prototype, test against the specification, refine
- Take apart something made by a professional
- Look at what you made

The Striving Muslim Academy

No answers at the back. The work is the answer.

Written for a parent teaching at home. No training assumed, and nothing else to buy.

strivingmuslimacademy.com

From a problem to a specification

Read this, then use it on the task pages.



FROM A PROBLEM TO A SPECIFICATION

At this stage you are not given the problem. You find it, and you are allowed to decide the one you were given is the wrong one.

Start with the user. Watch them do the thing, rather than asking them what they want, because people describe the workaround they have got used to rather than the difficulty underneath it. Studying how another culture solves the same problem is in the statutory wording and it is there for a reason: it shows which parts of your assumption were never necessary.

Then reformulate. Write the problem as a sentence about the user, not about the object: not "design a better bag" but "carry a week's shopping half a mile without using both hands".

A specification turns that into statements that can be tested and failed. Each one needs a number or a yes and no.

The Striving Mu

Systems: mechanical, electrical, and intelligent

Read this, then use it on the task pages.



SYSTEMS: MECHANICAL, ELECTRICAL, AND INTELLIGENT

A product that does something contains a system, and at this stage all three kinds are in scope.

Mechanical systems change movement or force. Levers and linkages change direction and size, cams turn rotation into a rise and fall whose shape you choose, gears and pulleys trade speed against turning force. Count the teeth and you can predict the trade before building it.

Electrical and electronic systems move energy round a circuit and can take heat, light, sound or movement as an input and produce any of them as an output. Draw the circuit, build it on the bench and test it before it goes inside anything.

Embedded intelligence is the third. A microcontroller reads a sensor, a program decides what counts, and an actuator acts. Write the rule in words first, in the order it happens, including what should happen when the reading is missing. That last case is the one that is always forgotten and always the one that fails.

The Striving M

Task 1: Specification, written before anything else

TASK 1

Specification, written before anything else



Find a real user with a real difficulty. Watch them do the task, then write the problem as a sentence about them. Then write a specification of six statements, each with a number or a clear yes and no in it.

WRITE IT HERE

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

The Striving

SAMPLE PAGES

You have read a few pages. The pack is longer.

What you are holding is a short sample, taken from different parts of the pack so that you can see how a week is planned and what a child is actually asked to do, before you decide.

The complete pack, and the rest of the academic materials, are on our website: schemes of work for a parent teaching at home, and practice packs for the skills children get stuck on.

The Striving Muslim Academy

strivingmuslimacademy.com

Islamic and Academic Education

Members of the homeschool community do not buy these. If you have joined the community, the pack for the term you are working on is given to you at no cost.

Our Islamic Education classes are free. These packs are part of what pays the teachers who teach them.