HM Government

T-LEVELS

T Level Technical Qualification in
Building Services Engineering for Construction

VERSION 1.0 EMPLOYER-SET PROJECT

Exemplar Response – E Grade

eduqas Part of WJEC | eal Part of the Enginuity Group

Contents

Task 1.1 – Research on Renewable Technology

Project: Primary School Extension – New Horizons Construction

I researched solar panels as a type of renewable energy. Solar panels turn sunlight into electricity, which can power things in the building. This saves money and helps the environment. I looked at different types of panels and chose monocrystalline because they are more efficient than the other type, polycrystalline. They work better when the sun is strong and take up less space.

For the building, I chose a modular method. This means the building is made in sections in a factory, then brought to the site and put together. This can be quicker and cause less mess on site. It is useful for schools because it can be done in the school holidays.

I found that solar panels cost around £10,000 to £13,000 for the system I looked at. The modular building is expected to cost around £150,000. There is also a water system, like a rainwater tank, and that costs around £20,000. These prices were from websites I looked at online.

The benefits are that the school can save money on energy bills. The solar panels can last for many years and reduce how much electricity the school needs to buy. The water tank helps to reuse rainwater, which is better for the environment. Over time, this can help the school save money and be more eco-friendly.

There are also some rules. The school might need planning permission before installing solar panels. The panels must also be safe to use and installed properly by trained workers. I saw this information on a government website.

I used a few websites to find out the costs and benefits, but I didn’t write them down. One website showed pictures and prices for different types of buildings and panels.

Task 1.1 – Record of Sources

Date	Source Title / URL	Type of Source	Notes / Key Points	Relevance
02/08/25	“UK Modular Classrooms” (modular-buildings.co.uk)	Website (company)	Says modular saves time, good insulation	Useful but might be biased – advertising
02/08/25	Wikipedia – Solar Panels	Online encyclopedia	Explains PV basics and south-facing roofs	General knowledge
03/08/25	Energy Saving Trust – Air Source Heat Pumps	Website (trust)	How heat pumps work, some pros/cons	Reliable source
03/08/25	Salix Finance – School Funding	Website (gov)	How schools can get funding for green projects	Very relevant
04/08/25	Gov.uk – Building Regulations Overview	Government website	Basic summary of UK building rules	Useful for regulations

Task 1.1 – Research notes

Project: New modular classroom with solar panels for a school in the UK

Key research areas (from brief):
- Modular building requirements in the UK
- UK building regulations and health & safety
- Water conservation
- Heat-producing technology (air source)
- Solar PV systems
- UK grants/schemes

Modular Building in the UK

- Modular buildings are made in sections in a factory and delivered to the site.
- Saves time because building can be done indoors.
- Timber frame is often used, lighter than brick.
- UK Building Regs – need to be “strong enough” and meet fire safety rules.
- Must have good insulation for energy saving.
- Some schools already use modular classrooms.

Health & Safety

- Workers need to wear PPE – hats, hi-vis vests, boots.
- Need signs to warn people where building work is happening.
- Scaffold or ladders needed for working on the roof.
- Crane work needs trained operators.

Water Conservation

- Rainwater tanks can be used to flush toilets.
- Saves money on water bills.
- Grey water recycling – not sure if suitable for schools.

Air Source Heating

- Heat pump uses air to make hot water or warm air.
- Works all year, but less effective when cold outside.
- Needs space outside for the unit.
- Not sure about exact costs.

Solar PV

- Panels turn sunlight into electricity.
- Works best on south-facing roof.
- Need inverter to change power to be used in building.
- Costs – about £5,000 to £15,000 depending on size.
- Can sell extra electricity back to the grid.

UK Grants/Schemes

- SEG – Smart Export Guarantee, payment for extra energy sent to grid.
- Salix – gives schools money for green energy projects.
- Might be other local council support.

Sources Used:

- Google search for “UK modular classrooms”
- Wikipedia – Solar panel basics
- Energy Saving Trust website – info on heat pumps
- Salix Finance website
- Gov.uk – building regulations summary

Task 1.2 – Report on Recommendations

Introduction
This report is about my ideas for the school building project. I looked at renewable energy and building methods to help save money and be better for the environment.

Renewable Technology – Solar Panels

I think the school should use solar panels on the roof. They make electricity from sunlight. This can help lower the energy bills. I chose monocrystalline solar panels because they work well in sunny weather. They are smaller than some other types, so they fit better on the roof. The panels cost about £10,000 to £13,000. I saw these prices on some websites. They should last for many years.

Building Method – Modular Build

I also think the school should use a modular build. This means the building is made in a factory and then brought to the school. This is quicker and makes less mess. It can be done in the holidays so it doesn't interrupt lessons.
The cost is about £150,000, which is the budget for the project.

Government Help and Rule
s
There are some government schemes, like Salix Finance, that can help schools pay for energy projects. There is also something called SEG where you can get money for extra electricity.

The solar panels should be fitted by trained workers. They need to be safe and follow the rules.

Conclusion

I think the school should choose solar panels and a modular build. They fit the budget and will help save money and help the environment.

Task 1.3 – Programme of Work and Supporting Statement

Programme of Work (6-Week Schedule)

This plan shows how the new classroom project will be done in the school summer holidays. The work is split into weeks so it is finished on time.

- **Week 1** – Set up the site with fences, warning signs, and clear the area.
- **Week 2** – Bring the modular building parts to the site and start putting them together.
- **Week 3** – Finish putting the building together and start work on the solar panels.
- **Week 4** – Carry on with the solar panels and start work inside (lights, water).
- **Week 5** – Finish all inside work like heating, plumbing, and electrics.
- **Week 6** – Check everything is safe, clean up the site, and hand the building over.

People and Trades Needed

- **Builders** – to prepare the ground and put the modular building together.
- **Solar panel installers** – to fit the panels on the roof and connect them to the electrics.
- **Electricians** – to wire the lights, sockets, and solar panels.
- **Plumbers** – to fit sinks, taps, and connect the water tank.
- **Site manager** – to make sure the work is done safely and on time.
- **Waste team** – to take away rubbish and materials.

Health and Safety

Everyone must wear PPE like hard hats, hi-vis vests, and safety boots. There will be signs to warn people about dangers. Only trained workers can use heavy machines like cranes.

Tools and Equipment

Big machines will move the modular parts. Workers will use ladders, drills, and harnesses for the roof.

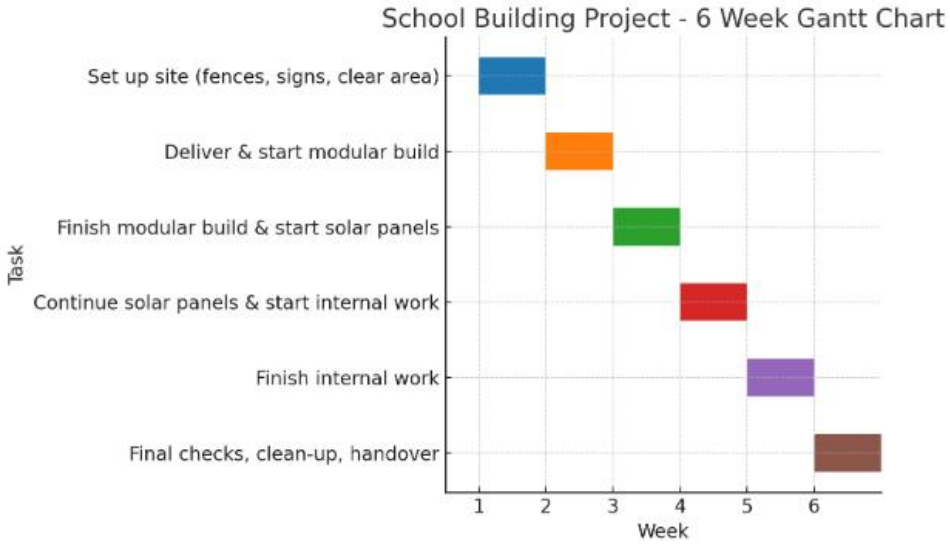
Waste Management

Rubbish will go into skips and be taken away regularly so the site is tidy and safe.

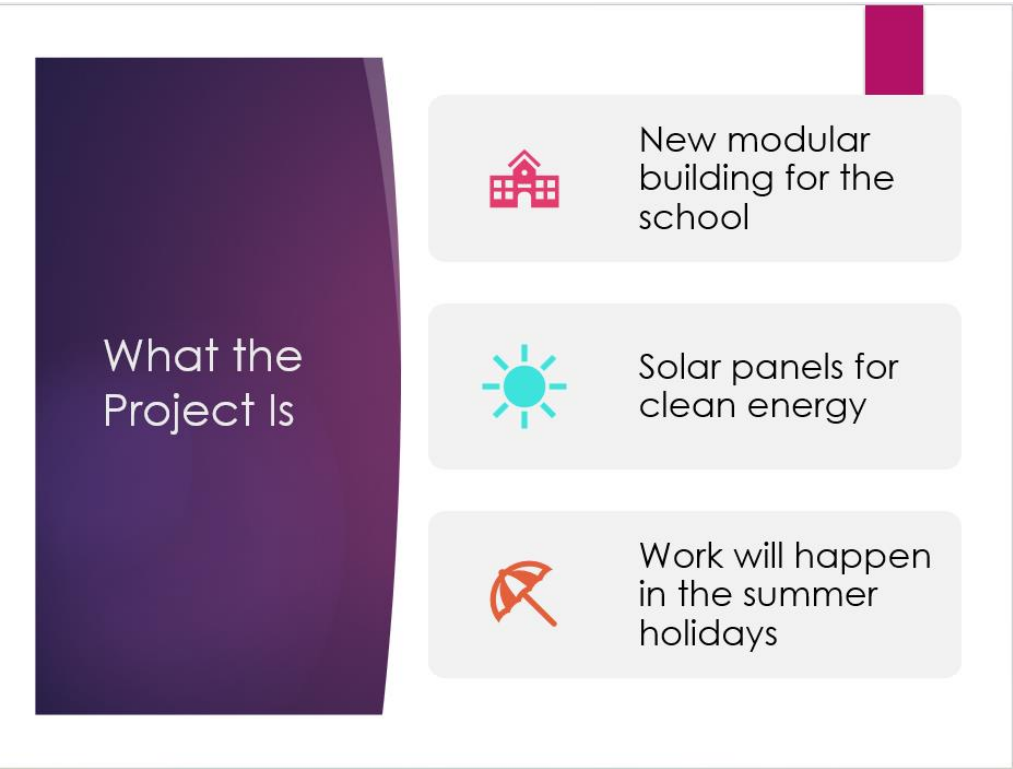
Timing and Supervision

The site manager will check the work each week. Jobs will be done in order so nothing is missed. The plan is for everything to be finished in 6 weeks so there is no disruption when school starts again.

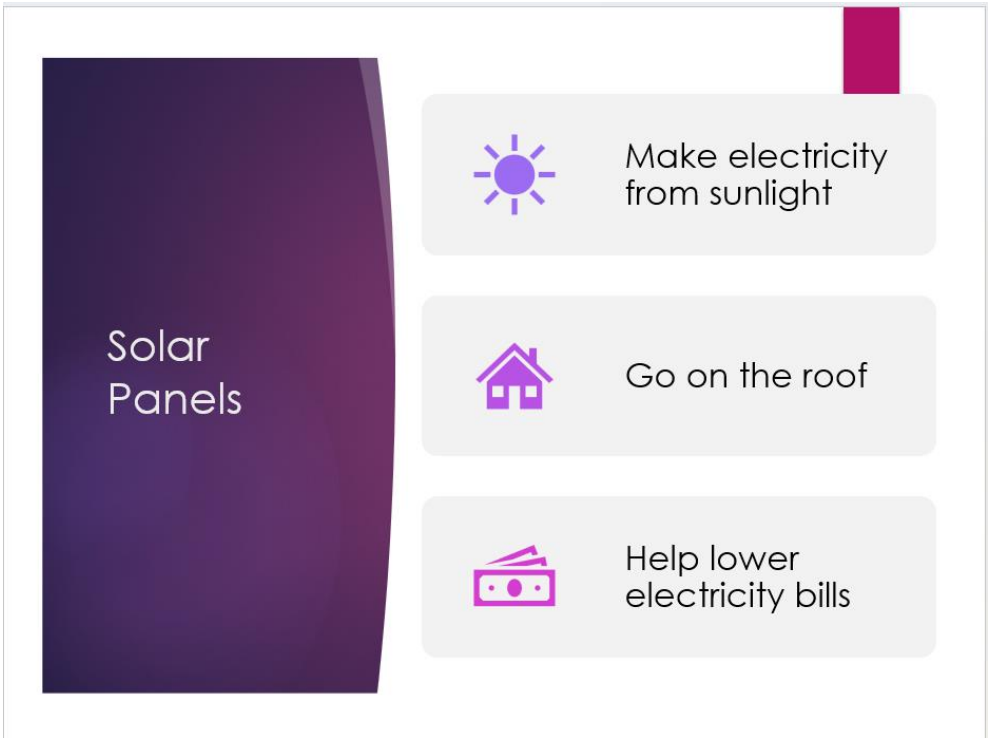
The whole project will take 6 weeks. This means it can be fully completed during the school summer holiday, so there is no disruption when pupils return.

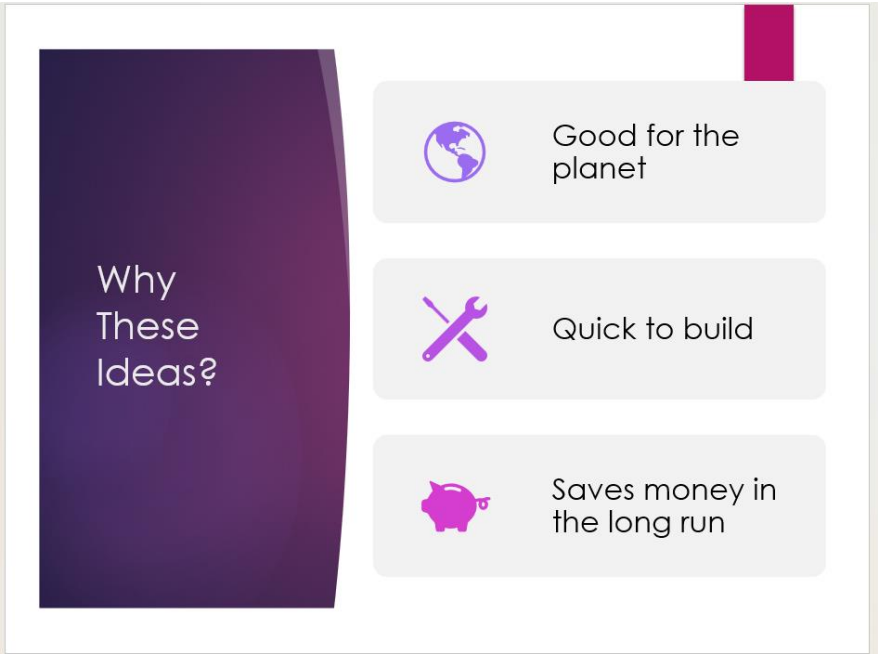

School Building Project - 6 Week Gantt Chart
Set up site (fences, signs, clear area)
Deliver & start modular build
Finish modular build & start solar panels
Continue solar panels & start internal work
Finish internal work
Final checks, clean-up, handover
Task
1
2
3
4
5
6
Week

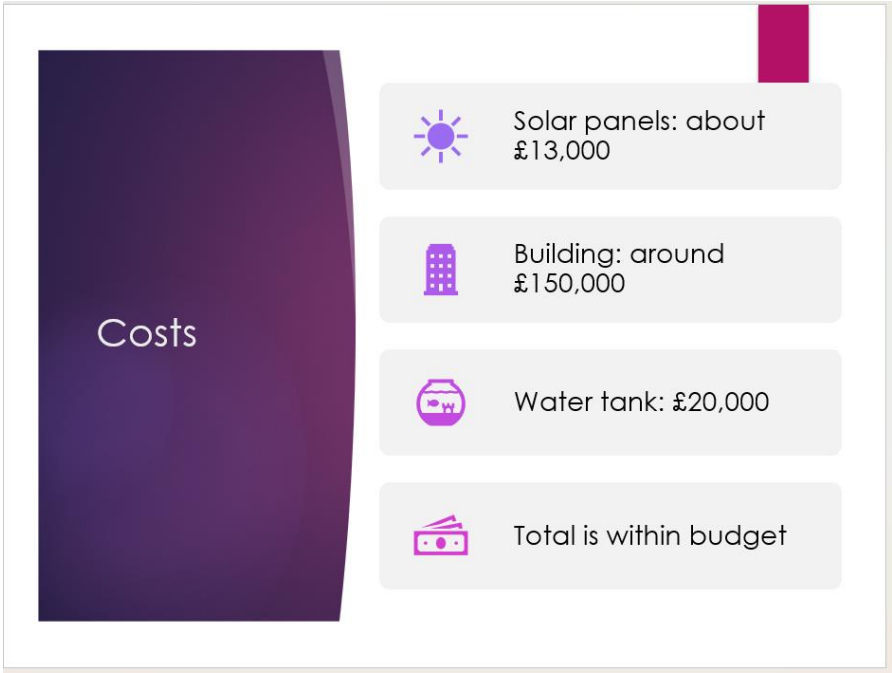
Task 1.4 – Presentation and Speaker Notes



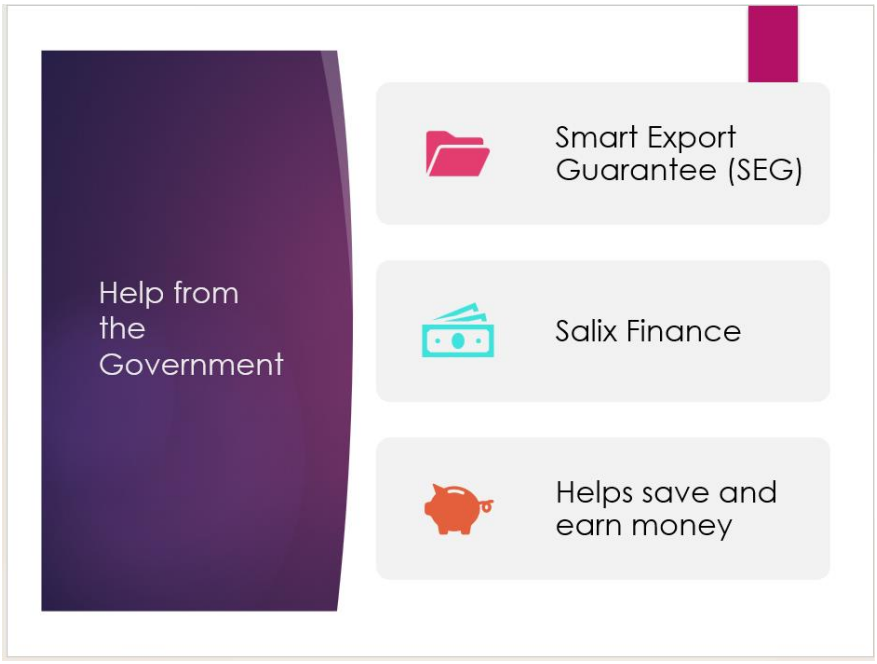

What the Building Will Be Made Of
Timber frame modular building
Built in a factory
Good for the environment

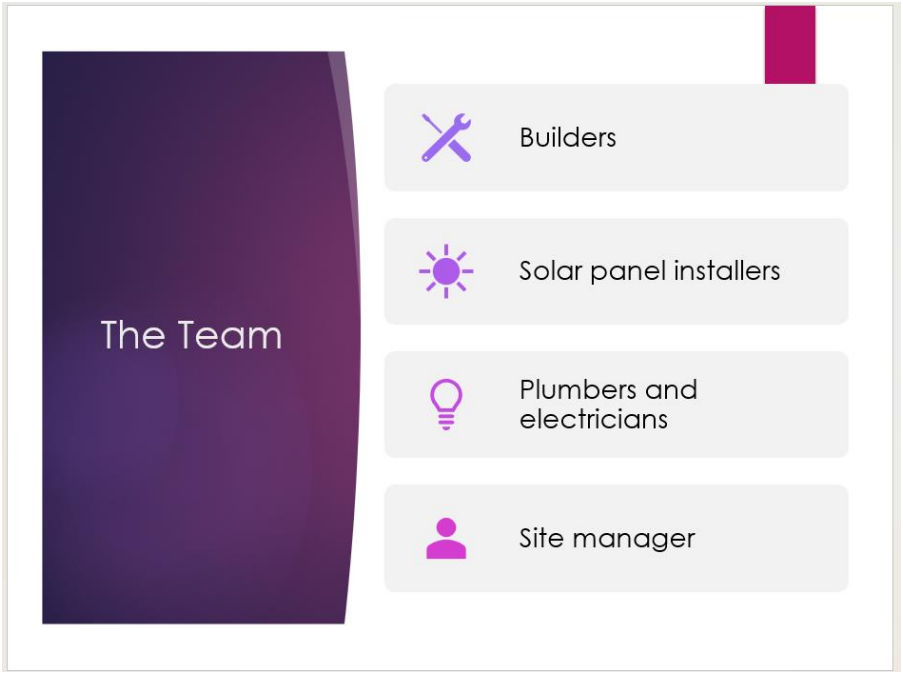

Solar Panels
Make electricity from sunlight
Go on the roof
Help lower electricity bills

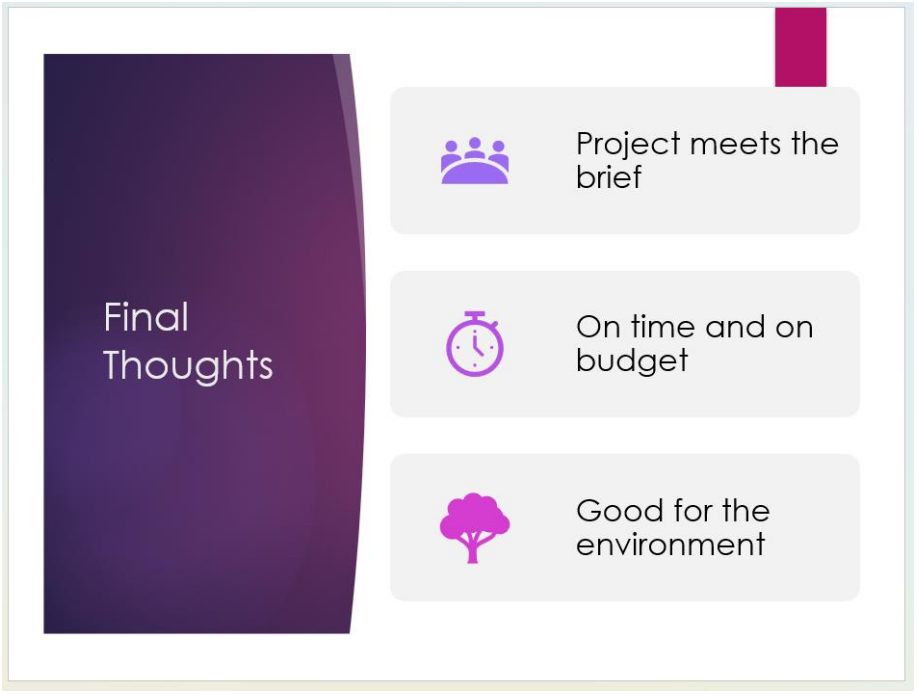

Why These Ideas?
Good for the planet
Quick to build
Saves money in the long run


Costs
Solar panels: about £13,000
Building: around £150,000
Water tank: £20,000
Total is within budget


Following the Rules
Must be installed by professionals
Health and safety on site
Needs permission from authorities


Help from the Government
Smart Export Guarantee (SEG)
Salix Finance
Helps save and earn money


The Team
Builders
Solar panel installers
Plumbers and electricians
Site manager


Final Thoughts
Project meets the brief
On time and on budget
Good for the environment

Slide 1:
Speaker Notes:
This project is for a new classroom at the school. It will be built in parts in a factory and then brought to the site. Solar panels will be added to the roof so the school can make its own electricity. This should help the school save money and be better for the environment. Work will be done in the summer holidays.

Slide 2:
Speaker Notes:
Solar panels take sunlight and turn it into power for the building. These will be put on the roof so they get the most sunlight. This means the school won't need to buy as much electricity.

Slide 3:
Speaker Notes:
The classroom will be made from timber, which is a type of wood. The sections will be made in a factory and then brought to the school. This saves time and there is less mess at the site.

Slide 4:
Speaker Notes:
The modular build is quick and can be finished in the summer so it won't disturb lessons. Solar panels only need paying for once and can last for many years.

Slide 5:
Speaker Notes:
Solar panels will cost about £13,000. The classroom is about £150,000. A new water tank is around £20,000. These costs fit the project budget.

Slide 6:
Speaker Notes:
The solar panels and classroom must be put in by trained workers. Safety rules like wearing helmets and high-vis jackets must be followed. The school might need permission from the council.

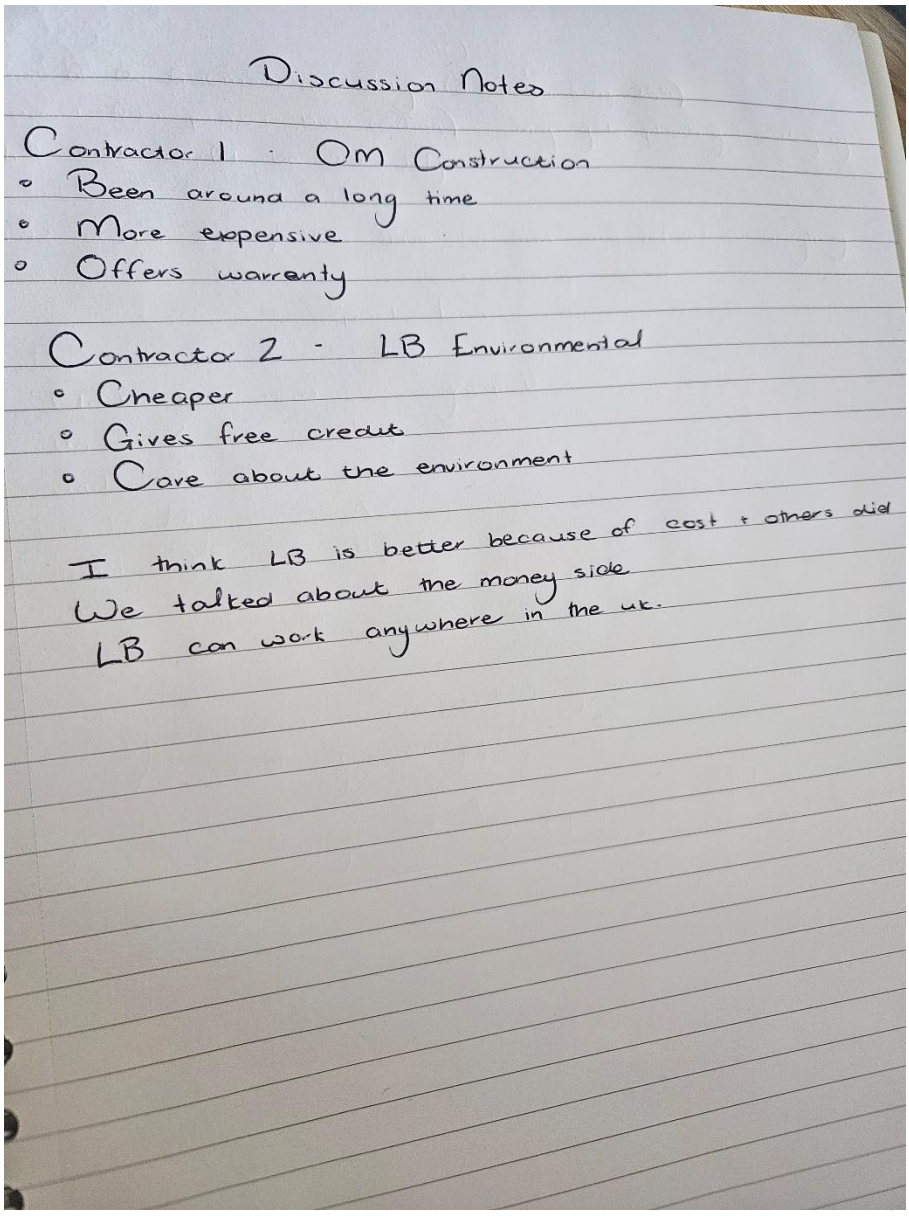
Slide 7:
Speaker Notes:
Salix Finance can help schools pay for energy projects. SEG means the school can sell extra electricity back to the grid.

Slide 8: Timeline
Speaker Notes:
The project will take **6 weeks** and happen in the summer holidays. This makes sure pupils are not disturbed.

Slide 9: People Needed
Speaker Notes:
Builders will put up the classroom. Solar installers will put on the panels. Electricians and plumbers will do the inside work. A site manager will check the work and safety.

Slide 10: Summary
Speaker Notes:
This plan is good because it is in budget and will help the school save money. It can be done in the summer and is better for the environment.

Discussion notes – E Grade



Discussion Notes

Contractor 1 - OM Construction
- Been around a long time
- More expensive
- Offers warranty

Contractor 2 - LB Environmental
- Cheaper
- Gives free credit
- Care about the environment

I think LB is better because of cost + others did
We talked about the money side
LB can work anywhere in the uk.

Task 2.1 – Observation Record

Candidate Name:	
Date:	

Overall Assessment Commentary

- Said LB Environmental was “probably cheaper” and might be able to beat other prices.
- Mentioned they liked that LB offered payment over time but wasn’t sure how it worked exactly.
- Said the company “works everywhere” so they should be fine for the school job.
- Agreed with another group member that they “do green stuff” which is good for the school’s eco aim.
- Did not mention any specific UK regulations or technical installation requirements.
- Sometimes spoke over others when trying to explain point about price matching.
- Needed to be asked directly for thoughts on the other contractor before responding (“oh, they’re just more expensive I think”).
- Agreed quickly with other members’ points rather than giving own detailed examples.
- Communication was basic, with some parts unclear (e.g., “they just work better” without explaining why).

Assessor Signature	
Name (printed)	
Date	/ /

Task 2.2 – Reflective Evaluation

I think the project went okay overall. We managed to finish it in the time given and stayed quite close to the budget. The new classroom was put up in the summer holidays, which meant lessons weren't disturbed. The solar panels were fitted, and they are working.

The project did meet some parts of the brief, like using renewable energy and trying to be eco-friendly. We also kept to the budget for most things. However, I'm not sure if we saved as much money as we could have because the water tank ended up costing a bit more than expected.

The building method worked well because it was modular, but we didn't plan for some small delays with delivery. This meant the solar panel installation had to be pushed back by a few days. We still finished on time, but it was a bit rushed at the end.

We could have done better in recording all our research sources and making sure we checked the technical details more carefully. Some things, like the exact rules for planning permission, weren't fully clear when we started.

Overall, I think the outcome was good enough for the school's needs, but it could have been improved by planning the timing better and checking details earlier.

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