Alternative Energy Battle Game

This game is designed to practice answering Physical Energy questions. They are based on the AQA P1a Module but the Physics is fundamental, and is relevant, whichever syllabus you are following.

This game is played with 2 players. The following pages contain the game sheet, and 3 question sheets with 3 separate sets of true and false questions. Rules for playing the game are included on the playing sheet. You will need to print out the question sheets and 1 game sheet for each player.

There are 3 games in this series available from GamePlan Games. All the games use the same 'True or False' questions, but each game offers a different playing objective. You can renew your motivation for learning the same facts by playing a different game. If you would like some new questions, why not buy the "Round the Block" game from our website?

Here is a summary of the Energy games, which are available for FREE download from www.GamePlanGames.co.uk

Game	No. of players	No. of sheets	Playing objective
Nuclear Boxes	2 or 3	1	To claim the most boxes
Insulated House Beetle	1, 2 or 3	1 each	To answer 5 questions correctly in a row
Alternative energy battle	2	1 each	To guess positions of your opponent's 3 energy sources

You can also download and print off the Revision Sheet which is designed to help you to understand why an answer you thought was right is actually wrong.

Please use the "Contact us" button on the web site to say which game you have enjoyed the most!!!

Alternative Energy Battle Game

Start by drawing your three alternative energy symbols in squares of your grid below

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							

1 square  Solar power

2 squares  Wave power

3 squares  Wind power

How to play

Players take it in turns to ask their opponent True or False questions from 2 of the question sheets

A player answering correctly gets to guess a square that their opponent has built their energy source on e.g. A3

Their opponent then answers with: 'miss' if the guess was wrong, 'hit' if the guess was correct but only one square has been guessed, or 'complete' when all the squares for that energy source have been guessed.

Both players mark off the guessed square, and play passes to the other player.

The winner is the one who discovers all of their opponent's energy sources first.

Opponent's Energy Sources

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							

Energy A – True or False?

1. Moving a book to a higher shelf increases its gravitational potential energy.
2. A bedside lamp transfers electrical energy into light energy.
3. The useful energy output from the screen of a mobile phone is heat.
4. Wool is a poor conductor because it traps air.
5. Skateboarding increases your kinetic energy.
6. All machines waste some energy.
7. A clothes iron transfers chemical energy into heat energy.
8. A motor converting 3000 joules per second has a power of 3000kW.
9. No machine is perfectly efficient.
10. Thermal energy passes through a sheet of glass by conduction.
11. A lamp converting 10 joules out of every hundred into light has an efficiency of 0.1.
12. A more efficient washing machine will transform a larger percentage of electricity into useful energy.
13. A car wasting 70 joules out of every hundred has an efficiency of 7.
14. A 2400W machine uses 2.4 kilowatt-hours in 60 minutes.
15. Energy from an immersion heater spreads through the water by radiation.
16. Heat energy is transmitted through the walls of a metal hot water tank by radiation.
17. Hot water tanks have jackets made of fibreglass because fibreglass is a good conductor.
18. If an object is warmer than its surroundings it will lose heat and cool down.
19. To reduce heat loss from a workshop you should increase the size of the windows.
20. A 4kW electric motor converts 400 joules per second into kinetic energy.
21. In most power stations in Britain, most waste heat is recycled.
22. A wave power station does not use fuel.
23. In a heat producing power station, steam is used to power a turbine.
24. The process used to produce energy from fuel in a power station is called radiation.
25. In a hydroelectric power station, falling water changes gravitational potential energy into kinetic energy.
26. A disadvantage of a hydroelectric power station is that it only works in wet and hilly areas.
27. The process used to produce energy from fuel in a power station is called fusion.
28. Energy from an immersion heater spreads through the water by convection.
29. To reduce heat loss from a workshop you should increase the thickness of the roof insulation.
30. All energy is eventually transferred to the surroundings as heat.
31. Nuclear power stations cause noise pollution and the supply is not constant.
32. Burning oil to generate electricity produces Carbon Dioxide.
33. Wind turbines have the highest decommissioning cost.
34. A power station using plutonium produces heat by nuclear fission.
35. In most power stations in Britain, most waste heat is used to heat neighbouring buildings.
36. Step-up transformers are used in the National Grid to increase the current.
37. Thermal energy passes through a sheet of glass by evaporation.
38. For the best insulation glass should not transmit infra red radiation.
39. A wave power station can be damaged by storms.
40. Wind power puts less sulphur dioxide into the atmosphere than coal powered stations.

Answers

True	False
1, 2, 4, 5, 6, 9, 10, 11, 12, 14, 18, 22, 23, 25, 26, 28, 29, 30, 32, 34, 38, 39, 40	3, 7, 8, 13, 15, 16, 17, 19, 20, 21, 24, 27, 31, 33, 35, 36, 37

Energy B – True or False?

1. The useful energy output from a speaker is sound.
2. Climbing a ladder increases your chemical energy.
3. A drill transfers electrical energy into heat energy.
4. If an object is warmer than its surroundings it will gain heat and cool down.
5. The energy input to a mobile phone is electrical.
6. Friction is often the cause of inefficiency.
7. Jumping off a roof increases your kinetic energy as you fall.
8. Copper is a better insulator than glass.
9. A motor converting 3000 joules per minute has a power of 50W.
10. A lamp converting 90 joules out of every hundred into heat has an efficiency of 0.9.
11. Wool is a poor conductor because it is soft.
12. Thermal energy passes through a sheet of glass by convection.
13. All energy is eventually transferred to the surroundings as light.
14. For the best insulation glass should not transmit microwaves.
15. The total energy input is equal to the useful energy output.
16. A 4kW electric motor converts 4000 joules per second.
17. The energy transferred by an 8kW immersion heater in 4 hours is 2kWh.
18. Energy from an immersion heater spreads through the water by evaporation.
19. Heat energy is transmitted through the walls of a metal hot water tank by conduction.
20. Hot water tanks have fibreglass jackets because they are good insulators.
21. Concrete is a better insulator than carpet.
22. A 2400W machine is equal to 2.40kW.
23. If an object is warmer than its surroundings it will gain heat and warm up.
24. To reduce heat loss from a workshop you should increase the temperature inside the building.
25. The process used to produce energy from coal in a power station is called fission.
26. A motor converting 3000 joules per second has a power of 3kW.
27. Voltage is decreased by a step up transformer.
28. Using uranium to generate electricity produces Carbon Dioxide.
29. Power from tides would be reliable as they occur twice a day.
30. In a hydroelectric power station, falling water changes chemical energy into heat energy.
31. Coal fired power stations transform chemical energy into heat energy.
32. Hydroelectric power stations have no fuel costs and can be used for sudden demands for electricity.
33. A power station using plutonium produces heat by chemical reaction.
34. In a heat producing power station, the heat is used to boil water.
35. Step-up transformers are used in the National Grid to increase the efficiency of the system.
36. Thermal energy passes through a sheet of glass by reflection.
37. A wave power station does not require any maintenance.
38. Most likely reasons for objecting to a wave power station are noise and visual pollution.
39. If the cost of a power station is £3.4 million and generates £100 000 per year it will take about 35 years to pay for itself.
40. Wind power does not make any dangerous waste.

Answers

True	False
1, 5, 6, 7, 9, 16, 19, 20, 22, 26, 29, 31, 32, 34, 35, 38, 39, 40	2, 3, 4, 8, 10, 11, 12, 13, 14, 15, 17, 18, 21, 23, 24, 25, 27, 28, 30, 33, 36, 37

Energy C – True or False?

1. A bell transfers electrical energy into sound energy.
2. A carpet is a better conductor of heat than copper.
3. The energy source for a nuclear power station is uranium.
4. A turbine in a power station is driven by electricity.
5. A turbine in a power station transfers kinetic energy to the generator.
6. A generator transfers energy to homes and factories as methane gas.
7. The best energy resource to use in a submarine which spends months under the water is nuclear fuel.
8. The best energy resource to use for a calculator is wind power.
9. Generators sited on hills in the UK are most likely to use tidal power.
10. A power station that includes a barrage across an estuary uses tidal power.
11. If each kWh costs 7p, 32 kWh cost £21.
12. The wasted energy output from a mobile phone is chemical.
13. The energy transferred by an 8kW immersion heater in 4 hours is 32kWh.
14. If each kWh costs 7p, a 2kW kettle can be used for half an hour for 7p.
15. Temperature controls on radiators save money by preventing the house becoming too warm.
16. Draught proofing is good because it pays for itself in the shortest time.
17. If loft insulation costing £200 saves £50 per year- it takes 5 years to pay for itself.
18. A motor converting 3000 joules per minute has a power of 3W.
19. Electricity is transmitted across the country by the National Grid.
20. When a motorcycle engine gets hot it emits mainly infra red radiation.
21. A kettle transferring 95 joules out of every hundred into heating water has an efficiency of 95%.
22. Tidal energy is free but unreliable.
23. Wind power puts less carbon dioxide into the atmosphere than an oil power station.
24. Infra red radiation does not involve any particles.
25. In a motorcycle engine, to make heat loss more rapid fins increase the surface area.
26. Air in contact with the outside of a saucepan expands and rises due to increased density.
27. A disadvantage of a hydroelectric power station is that it only works when the wind blows.
28. The process used to produce energy from fuel in a power station is called burning.
29. To reduce heat loss from a workshop you should have single glazed widows instead of double glazed ones.
30. When making a solar panel the black top surface reflects radiant energy.
31. Nuclear power stations have high decommissioning costs.
32. A nuclear power station takes up less space than a wind farm for the same amount of energy because the energy in wind is more spread out than in nuclear fuels.
33. The fuel costs for nuclear power are low.
34. In most power stations in Britain, most waste heat is released into the surroundings.
35. Large wind turbines may be set up far out at sea because there is less pollution than on land.
36. Burning coal to generate electricity produces Carbon Dioxide.
37. One disadvantage of a tidal barrage is that it cannot be used in the summer.
38. Nuclear power stations produce radioactive waste which must be contained.
39. In a hydroelectric power station, falling water changes thermal energy into kinetic energy.
40. Step-up transformers are used in the National Grid to increase the speed of transmission.

Answers

True	False
1, 3,5 ,7, 10, 13, 14, 15, 16, 19, 20, 21, 23, 24, 25, 28, 31, 32, 33, 34, 36, 38	2, 4, 6, 8, 9, 11, 12, 17, 18, 22, 26, 27, 29, 30, 35, 37, 39, 40