



Defined STEM: Chemistry Tasks

Automotive Materials Engineer – Fuel Efficiency

Using materials to build vehicles – students could use the properties of matter located on the periodic table to conduct stoichiometry to determine the mass of the vehicle depending on the type of pure element used. This would involve them using more mass and converting to quantity is much larger – stoichiometry.

Students could analyze the strength of materials to identify forces between particles – examples of particles indicated in the NexGen; include network materials like graphite. Both properties include melting point boiling point and surface tension – this could be applied to other bulk forces and materials.

HS-PS1-1, HS-PS1-3, HS-PS2-6

Chemical Engineer: Carbon Fiber

Students could analyze the reduction in materials and put the results based on the difference in the materials used to construct the plane – ultimately analyzing conservation of mass in combustion reactions and amount of fuel consumed.

HS-PS1-1, HS-PS1-3, HS-PS2-6

Chernobyl Tour Operator

Students must develop and understand models to illustrate changes and composition of nucleus of atoms and energy really strong processes of fission fusion and radioactive decay – emphasis is on qualitative models using pictures and diagrams scale of energy released in nuclear processes relative to other kinds of transformations.

Students must communicate scientific and technical information about molecular structure and it's important in the functioning of designed materials parentheses i.e. evaluate materials used in nuclear power plants to determine why molecular structure is used to design certain things)

Students must understand PS 1–8 to apply this knowledge to the reasoning behind exclusion zone stash the connection between radioactive decay half-life etc.

HS-PS1-8

Civil Engineer: Urban Heat Islands

Consider the materials in an urban heat island and how their chemical make-up impacts the heat island and how temperature and CO₂ are connected.

Students could analyze the impact of combustion reactions as they affect urban heat island – create modest illustrate releases of energy from chemical reaction systems dependent on bond energy (PS 1–4) apply principles to determine explanation about the effects of changing the concentration of reacting particles (PS 1–5)

HS-PS1-4, HS-PS1-5



Civil Engineer: Water Treatment

Students must apply scientific principles and evidence to provide information about changing temperature in concentration of reacting particles and the rate at which reaction occurs within the system.

Refine design of chemical systems by identifying changes in conditions that produced increased amounts of products in equilibrium – analysis of materials in water and outputs to determine the impact on water quality.

HS-PS1-5, HS-PS1-6

Contractor: Materials Analyst

Students can analyze materials to develop models that would analyze the structure of substances in the breakdown of substances as they occur within decomposition reactions. Ps 1-2

Living building challenge analysis – analysis of red list would allow students to evaluate why molecular level structure is important in the functioning of designing materials.

Analysis of chemical attributes, functioning and molecular structure of Red List

Green Chemistry and Decomposition reactions

HS-PS1-8, HS-PS1-2, HS-PS2-6

Fire Hazards Research Team

Requires students to communicate scientific and text the confirmation about molecular level structure and why it is important in the functioning of design materials including specifically combustion reactions.

Additionally, students must construct explanations to evaluate outcomes of reactions based on electron states of Atoms and knowledge of patterns within chemical properties.

Rates of flammability for materials based upon time. Combustion Reactions

HS-PS1-5, HS-PS1-2, HS-PS2-6

Nuclear Energy Scientist

Students must develop and understand models till Street changes and composition of nucleus of atoms and energy really strong processes of fission fusion and radioactive decay – emphasis is on qualitative models using pictures and diagrams scale of energy released in nuclear processes relative to other kinds of transformations.

Students must communicate scientific and technical information about molecular structure and it's important in the functioning of designed materials parentheses i.e. evaluate materials used in nuclear power plants to determine why molecular structure is used to design certain things)

Develop modest illustrate the releases or absorption of energy from chemical reaction systems depend on change in total bond energy.



Could create mathematical representations to support claims atoms in there for mass or concerns during chemical reactions/as opposed to nuclear reactions

Apply scientific principles and evidence to provide exclamation about the effects of changing the temperature of concentration of reactants articles on the rate at which reaction occurred – ultimately identifying how the changes in the temperature of water being released by Power plants will impact them aggressions within the system.

Energy change by increasing the temperature of water released will increase the rate of reactions that occur in the surrounding environment in some cases.

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Students must understand PS 1–8 to apply this knowledge to the reasoning behind exclusion zone stash the connection between radioactive decay half-life etc.

HS-PS1-8, HS-PS2-6, HS-PS1-4, HS-PS1-7, HS-PS1-5

Manufacturing Analyst: Carbon Fiber

Students could analyze the reduction in materials and put the results based on the difference in the materials used to construct the plane – ultimately analyzing conservation of mass in combustion reactions and amount of fuel consumed.

Analyze the different types of fuel and bond energies within each to determine the best type or alternative types of fusion fuels to reduce the amount of pollution causing chemicals that results from the combustion reaction.

Analyze output of combustion reactions and byproducts.

HS-PS1-1, HS-PS1-3, HS-PS2-6

HS-PS1-2, HS-PS1-4, HS-PS1-7

Paint Processing Engineer: Chemical Processes

Students must be able to explain the patterns of chemical properties

Students must understand PS/1 -3: gather evidence to compare structures of substances at books Gail to and for the strength of electrical forces between particles – attractions between ions, Adams, molecules, and it works materials.

Also must understand ideas such as vapor pressure – which impacts the VOC's of paints

Students must be able to communicate scientific and technical information about molecular level structure why it is important and how it impacts designed materials and their function. Paint types and powder coating process

HS-PS1-2, HS-PS1-3, HS-PS2-6

Water Treatment Specialist



Students must analyze water content to gather evidence to provide explanations about the effects of changing temperature and concentration of reacting particles and the rate at which reactions occur

Students: analyze the chemical system identifying changes in conditions that produce increased amounts of products at equilibrium – analyzing chemical reactions taking place both outside of the aquatic environment and inside the aquatic environment that impacts the concentration of different chemicals within the system.

HS-PS1-5, HS-PS1-6