

May 6, 2013

Dear Task Force on Education,

After listening to the comments provided at community forums, I would like to respond. This is necessary so that the Task Force knows the underlying reasons on various ways that strengthens education in Idaho public schools. Specifically, there is a view that a number of people are against the Common Core Mathematics standards. If their views prevail, elements that support delivery of the Common Core standards into the classrooms (e.g., curricular materials, higher standard standardized tests, professional development of teachers) will neither materialize, nor receive adequate funding.

Students learning mathematics and science at a higher level are necessity for citizenship, and living in the real world for career and postsecondary education. The education needed for the postsecondary is well known, and it will be elaborated further.

These days, citizens require science background to be effective citizen. Citizens participate in jury duties, deliberate in the formulation of government's policies and vote for candidates in elections or on a specific matter in referendums that impact the entire community. The success of the citizenship strongly depends on the strong fundamentals and the critical thinking skills they learned in schools. In courts, jurors are confronted with DNA evidence. They must weight the merit of technical evidence before they reach a decision.

Furthermore, in Idaho Falls, ID the entire community has been confronted with a number of technical issues whether the government should reprocess spent nuclear fuel, or Areva be given a license to operate uranium enrichment plant, should the wind mill farm be expanded, and the routes for high voltage transmission lines. Before deciding the merits of each issue, they must have sufficient background to understand the science. For example for uranium enrichment plant, when  $UF_6$  container leaks and reacts with water in the atmosphere, it produces HF (hydrofluoric acid). HF poses more danger than the radioactive uranium. In the case of high voltage power supply, the citizens must weigh in the available evidence on the relationship between cancer and the transmission lines. To understand the evidence, one must understand the underlying science. This requires ability to read articles at the level of *Scientific American*.

As far as profession that does not require college education, but require strong mathematics and science education.

**Profession      Relevant Core High School Courses/Specific Topic**

**Machinist      Math and Chemistry:** Trigonometry is needed determine dimensions to fabricate specially designed item, to know the contents of the materials (e.g., steel, brass, etc.), chemical treatment of metals, lubricants.

**Farmer Biology/Chemistry:** One example is on orange groves. The circumstances under which oranges get damaged strongly depend on the freezing temperatures. Oranges get permanently damaged when temperature drop to  $\sim 28$  °F. The lowering of the freezing point is due to presence of other stuff with water in the orange juice. Chemistry tells us that freezing point reduces when water have impurities. Furthermore, when it is frozen, water in the orange expands. When this occurs, it

causes cells to damage. Additional chemistry background provides the understanding of agriculture chemicals (e.g., fertilizers and pesticides).

Photographer **Physics:** Need to know optics, such as lenses, prisms, filters, polarizers, etc. This makes a difference in the quality of professional photographs.

Truck Driver **Chemistry/Math:** Drivers of hazardous chemicals, and appreciate differences between chemicals and it would impact their health. Quick computations on the fuel needed based on the driving requirements.

Auto Mechanic **Chemistry:** Needs to know about exhaust gases coming from the car, and their significance for pollution controls.

Plumber **Chemistry:** Need to know about the corrosion properties when using dissimilar metals, types of chemicals needed to dissolve a clog, ways to clean surface materials.

Chef/Cook **Chemistry:** Need to know how cooking procedure change from a low altitude to a high altitude region. Water boils at lower temperature at higher altitude. A way to mediate it requires adding salt. This information can be readily understood from chemistry.

X-Ray Operator **Physics:** Understanding of how X-ray radiation gets generated, and the ways to mediate it. (This topic would be covered in modern physics.)

Construction Worker **Mathematics:** Roof installer needs to have strong background in geometry and trigonometry. They need to know the surface area of the roof. They get this by making careful measurements on the dimensions that are easy to measure. Using these measurements, they need to use mathematics to determine the area.

The professions described above are illustrative, but not exhaustive. In view of this, science, technology and mathematics courses would not be diluted, and would receive the needed support.