

Working with Wood – Carpenter Glue

Analysis of a Material Safety Data Sheet

Info in red font is for the benefit of the teacher (ideas for differentiated learning etc). Delete text in red font from the copies that are distributed to students.

Version History:

V #	Date	Author	Short Listing / Description of Changes
1	June 8/12	D.B. McCowan	Initial Version -- uploaded to OCTE Safety Portal
2			

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1 Expectations – Analysis of Data

Design / Build a Marketable Picture Frame Using Scrap Wood Flooring	
1 Curriculum Expectation <i>In this unit the student will demonstrate / practise the following:</i>	2 Activity -- What You Will Do in this Lesson
D1.2 -- demonstrate an understanding of and follow personal and environmental health and safety procedures with respect to processes, materials , tools, equipment, and facilities throughout the design process and related activities (e.g., use protective equipment; set tool and equipment guards properly; ensure adequate ventilation and ergonomic seating and other workplace arrangements; follow safe operating procedures; keep work areas clean and organized; store materials and dispose of wastes properly).	Risk Assessment ---What do I need to know about carpenter glue before using it? Assessments -Knowledge -Thinking -Communication

2 This Lesson is Extremely Important Because...

Modern glue compounds are generally synthetic chemicals that are made of very large complex molecules. The liquid glue in the bottle has certain properties or characteristics, some of which could be harmful. Chemical reactions take place as the glue hardens when applied – the chemical

reaction(s) could be harmful. After glues have hardened, sanding off excess glue will put dust particles into the air that you breathe – which could be harmful.

The lesson is not about using glue. This lesson provides a strategy for finding important information in a complex technical document and then storing your understanding of important concepts in your long-term memory for future applications.

CC = This is a significant cross-curricular learning opportunity – science class

3 Input – Material Safety Data Sheet (MSDS)

You should have already studied WHMIS – Workplace Hazardous Materials Information Systems in science class. And you should already know something about the importance of Material Safety Data Sheets. Just knowing where the MSDSs are stored in the room is only a small part of your responsibility in this area.

Open up and read this very official document -- LePage_Carpenter_Glue_MSDS.pdf. Pretty detailed, right? Too detailed for high school students?

When confronted with an abundance of detailed information, you need to be able to identify the 20% of the information that gives you 80% of the value. But, you say, when it comes to safety, we need 100% of the value! That is a very good point! Nonetheless, using the 80-20 principle is a valuable strategy for learning. This is very important critical thinking – especially when it comes to safety.

4 Knowledge: Regarding LePage_Carpenter_Glue_MSDS.pdf

Knowledge questions seem like the easy ones – after all, you just need to memorize the answer, right? (You may need to read or 'study' something first!)

But to achieve something of value in your working career (and to get paid for your efforts), you will need to do something with your knowledge that is important to your employer. You need some significant understanding of that knowledge and some appreciation of why the knowledge is important in a variety of situations. In other words, you need to know how to apply your knowledge with sufficient accuracy and completeness in order to solve problems and deliver on opportunities.

Nonetheless, let`s begin with some of the obvious important knowledge from LePage_Carpenter_Glue_MSDS.pdf. You may need to first translate statements into your own words in order to make the answer a little more clear.

Note to Teacher

-Delete answers / feedback in red font prior to distribution to students – take up afterwards
-This learning activity could be in the form of a quiz in an on-line learning management system such as Moodle.

#	Question	Answer / Feedback
1	If you inhale carpenter glue, respiratory tract irritation may result. (T/F)	True Makers of glue never intended it to be sniffed.
2	It is acceptable to scoop up a spill of carpenter glue and flush it down the toilet because carpenter glue is water dispersible. (T/F)	False Even if the glue was water soluble, this would not be an acceptable way to dispose of this wasted glue.
3	Vinyl acetate polymers is a hazardous component of the glue and make up approximately half of the total ingredients of the glue. Roughly half of the total ingredients are not hazardous. (T/F)	True Note that there is a wide range in the percentage of vinyl acetate polymers.
4	There are concerns regarding breathing, touching and swallowing carpenter glue. And don't rub your eye with your fingers while working with carpenter glue. (T/F)	True
5	It is ok to spill carpenter glue on the floor because: a carpenter glue is inexpensive b you can wipe it up with your hanky and get your mother to wash it c go ahead and use the glue on the floor in your project because the dirt on the floor will not affect the strength of your glue joint. d The question has a false premise.	d Be careful. Take pride in your work. Develop work habits over and above those of others. Do not spill or otherwise waste any material that you work with.
6	Ventilation is not required because the Permissible Exposure Limit (PEL) for the major hazardous component -- vinyl acetate polymers -- is declared on the MSDS as 'None'. (T/F)	False Class discussion, eg: According to the MSDS, ventilation to keep the concentration below half of the PEL is required. But, a) how can students measure the concentration? and b) the PEL is declared as 'none'. Perhaps the MSDS should more clearly state that there must be ventilation, not just 'should'. Or, simply, the classroom policy must be to have ventilation turned on.
7	The MSDS warns you to always wear skin protection such as gloves when working with carpenter glue. (T/F)	False The MSDS generally puts the onus on the user and the employer to make the right decision regarding the use of gloves " and to adopt such precautions as may be advisable ".

5 Thinking / Analysis: Regarding LePage_Carpenter_Glue_MSDS.pdf

Thinking questions are tougher. You may need to interpret several passages together. You may need to sort some of the data first. You may need to first find some other information and integrate with the recent input. You may need to unravel the logic in the question. For example, in a True or False question, if even only one sentence in the overall statement is false, then the entire statement is false (even if 4 sentences in the overall statement are true).

In some thinking questions, there may not even be a single correct answer. There may be a best answer in this kind of situation and another best answer in another kind of situation. There may even be yet another best answer in this *particular* situation. Indeed, some Thinking questions are really Application questions – putting yourself in a particular situation.

In some thinking questions, there may not be a known, well-understood single correct answer at all! These thinking questions are meant to get the class talking – discuss the question in class and see if you can find some really important underlying concerns and some 'what ifs'. For example, *what if we had a 45 gallon drum of carpenter glue in the classroom?*

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#	Question	Answer / Feedback
1	There are people who want to sniff glue to get high. The phrase 'slight irritation' is not nearly strong enough with respect to inhalation. It should say 'DO NOT SNIFF THIS GLUE'. (T/F)	Class discussion. Eg: Should all bottles of glue be in a locked cabinet?
2	The MSDS should be: a stored in the classroom safety manual on the teacher's desk b posted on the wall near the gluing workstations c thrown out because all of the important information is on the glue bottle label d both a and b are correct	d This thinking question involves going back in your memory to the key aspects of WHMIS which you learned in science class.
3	Students must memorize at least half of every MSDS. (T/F)	False Students should be trained to use their own thinking skills such that they can learn what is important and why.
4	The percentage of the ingredients that is hazardous is only 30 to 66 percent, so there is no cause for alarm. (T/F)	False Class discussion, eg: This means that as many as 660,000 parts per million (ppm) are considered hazardous. Students should compare this ppm to the allowable ppm in the effluent from industrial processes going to the sewers, for example.
5	Carpenter glue may cause gastrointestinal tract irritation if ingested. Swallowing is not expected under normal conditions of use. No one will ever drink carpenter glue so it is ok to leave it on the desk at all times. (T/F)	False Class discussion, eg: There may be people in your class who do not understand issues like this. Because roughly half of the ingredients are considered hazardous, the glue should probably be stored in a locked cupboard.
6	If someone gets the glue in his or her eye, help him/her rinse the eye until you do not see the glue anymore. (T/F)	Class discussion, eg: 15 minutes of rinsing is the minimum, or until the glue is completely washed out. In section 9 of the MSDS, it is stated, for solubility in

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#	Question	Answer / Feedback
		water, that carpenter glue is 'dispersible'. What does this really mean in the context of trying to remove a blob of carpenter glue from someone's eye?
7	Safety glasses are not required because the MSDS says that eye / face protection is not available. (T/F)	False Because we now know that water does not easily dissolve carpenter glue, it should be a classroom policy to wear safety glasses when working with carpenter glue.
8	You were careless when gluing your parts together. Big blobs of glue dried on the surfaces and you would like to remove them to get a better mark. So you want to sand the dried glue off. You should: a go ahead and start up the disc sander on your own because you do not want the teacher to know that your workmanship during gluing was so poor. b take your project home and use a portable rotary sanding tool in your bedroom c check the glue's MSDS – the upper and lower explosive limits are not determined, so high speed sanding in a small non-ventilated bedroom is ok to do d in your project reflection, declare that you realize that you should have been more careful during gluing	d Class discussion, eg: Learn from your mistakes. Next time, take more pride in your work while you are actually doing the work. The fact that the MSDS declares that the upper and lower explosive limits are not determined is a significant concern – it appears that they just do not know. If too much sanding of glue is done in a small room and if there is too much glue dust in the air, an electrical or other spark or flame could cause ignition and a fire. But no one seems to know at what concentration this could happen – and we won't have the instrumentation to measure this concentration anyway. Ventilate.
9	There are no known existing skin conditions that are aggravated by exposure to this glue. So if you have eczema on your fingers you need not wear gloves. (T/F)	False We can interpret the existing conditions part of section 2 in the MSDS as ' <i>we don't have enough information yet</i> '. So, therefore, extra caution is very advisable – put the gloves on.
10	The following MSDS sections are required by law in all MSDS documents: a Product and company info; Hazards identification; First aid measures; Handling and Storage b Accidental release measures; Fire fighting measures; Toxicological info; Disposal info c Personal Protection; Ingredients info; Reactivity; Regulatory info d Transport info; Ecological info; Exposure control; Chemical Properties	a This thinking question involves going back in your memory to the key aspects of WHMIS which you learned in science class. Good luck with this kind of memory work! Your best bet is to use your thinking skills to find relevant information – do some research. Finding and interpreting information is an important task in thinking and making decisions.
11	It is ok to have a 45 gallon drum of carpenter glue in the school because it is just carpenter glue. (T/F)	False Such a large volume is unwarranted in a school. This is an industrial volume and warrants extra precautions. Have just enough carpenter glue on hand to get the job done.

6 Assignment – 100 Marks (Thinking and Communication)

You and your classmates are using carpenter glue to each assemble a popsicle stick bridge. You will not be cutting any popsicle sticks. Discuss in detail the three safety concerns that you believe are most significant. Defend your selection of these three concerns – why are they more significant than other issues? Your response will be graded against Written_Report_Rubric.doc. (100 marks)

Three major issues that should be considered in an answer:

- being knowledgeable, aware of hazards / risks and prepared for an emergency
- ventilation -- glue is a chemical
- wear safety glasses – both glue concerns (not water soluble) and popsicle sticks that may flip up

Along with supporting details by the student.

7 Safety Reminder

Always wear safety glasses when there is any risk of flying objects or the presence of a liquid chemical.

8 Peer Assessment

NOTE: In the feedback, the Peer Assessor must “make the student think” – not give the student the answer! Be sure to include comments justifying the assessment value that you are giving. Peer Assessor must put his / her comments in red font.

Assessor’s Name and Additional Notes:

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