STEM Team Duxford

Young Investigators Day

13th June 2012

Risk Identification

Imperial War Museum Duxford provide a general Risk Identification for School Groups attending events at the Museum. You can down load this from: http://www.iwm.org.uk/learning/iwm-duxford/visits/risk-identification

STEM Activity Risk Identification

These risk identification documents consider any hazards specific to the activity greater than every day hazards such as slipping, tripping or falling on stairs, trapping fingers in doors and cuts and bruises which are inherent in all environments.

Provider	**STEM TEAM East**		
Activity Description	**Hands on STEM Fair at Imperial War Museum Duxford**		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Overcrowding	low	This event is a pre-booked. Participants will be asked to sign in on arrival and room capacities will not be exceeded.	low
Working with Children	low	All STEM Team East Staff and STEM Ambassadors volunteers are fully CRB cleared for working with young people and have public liability insurance, professional indemnity insurance and employer liability insurance and personal and travel insurance. No STEM Team East staff or STEM Ambassador will work alone with a young person.	low

1. Risk Identification: Paper Tube 3d Solid

Provider	**STEM TEAM East**		
Activity Description	**3D solids - Symmetry and tessellations all around us**. Mathematics is all around! Using images from nature and different cultures we explore symmetry, tessellations and 2D and 3D shapes. Pupils make the cubohemioctahedron from card and rolled paper tubes.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Cuts from scissors and paper.	low	Students will be provided with safety scissors and warned to take care using the paper to make their structure.	low
Use of nuts and bolts.	low	Students will use nuts and bolts to join rolled paper tubes together. They will tighten them using their fingers. They will be warned not to put the nuts and bolts in to their mouths.	low

2. Risk Identification: Paper Tube Crane

Provider	**STEM TEAM East / University of Cambridge Engineering Department**		
Activity Description	**Cambridge University Engineering Department Crane Build.** Led by a talk from the Engineering Department, pupils discover the engineering involved in designing strong structures. They make a crane jib using rolled paper tubes connected with nuts and bolts. The jib is then load tested.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Cuts from scissors and paper.	low	Students will be provided with safety scissors and warned to take care using the paper to make their crane jibs.	low
Use of nuts and bolts.	low	Students will use nuts and bolts to join rolled paper tubes together. They will tighten them using their fingers. They will be warned not to put the nuts and bolts in to their mouths.	low
Injury through testing bridges with weights.	medium	Bridges will be weight tested using food cans. Load testing will be done by adults in a designated area away from the build area. Pupils will be warned to take care when testing to ensure weights do not drop onto their feet or hands.	low

3. Risk Identification: K'Nex Engineering Challenge

Provider	**STEM Team East**		
Activity Description	**K'Nex Engineering Challenge** Students design and build scale models of bridges, cranes, vehicles etc from K'Nex learning the forces and loads which Engineers have to take into account to build strong structures.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
K'Nex components	low	To prevent a choking hazard, students will be warned at the start of the activity not to put small pieces of K'Nex into their mouths.	low
String	low	Students will be warned at the start of the activity not to wrap string around any part of their body.	low

4. Risk Identification: Bottle Raft

Provider	**STEM Team East**		
Activity Description	**Plastic Bottle Raft- Plastic Pollution and the Environment.** The problem for wildlife, ecosystems and our planet due to plastic waste in the oceans is highlighted from our use of the ubiquitous plastic bottle. Pupils are encouraged to think about plastic pollution and what scientists and engineers of the future may do to resolve the problem. Pupils make a raft from recycled plastic, card and wooden sticks to highlight the campaign to arrest plastic pollution. They will test the buoyancy of their raft.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Cuts from paper and scissors	low	Pupils will be provided with safety scissors and warned to take care using the paper to make their rafts.	low
Glue	low	Rafts will be constructed using double sided sticky tape and solvent free glue.	low
Bottle lids	low	Rafts will be constructed using milk bottle lids. These are thoroughly cleaned before use.	low
Testing in a water tank	low	Rafts will be tested in a plastic tray in a designated area outside the manufacturing area. This area will be cordoned off and testing will be conducted under adult supervision. A mop and bucket will be provided to clear up any overflow water. The depth of water will not exceed 20 cm.	low

5. Risk Identification: Satellite

Provider	**STEM TEAM East**		
Activity Description	**Satellites - IT and Communication.** Circular motion and projectiles teach us all we need to know to understand the science of the solar system and how we put satellites into orbits. We will examine how much we rely on information from satellites and make a model satellite to identify key features.		
Who will be exposed to the hazards: School Students and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Trip Hazard	medium	All electrical cables will be securely attached to the floor to reduce the likelihood of people tripping over.	low
Electric Circuit	low	Pupils will make an electric circuit using a LED, wires, batteries and battery holder. They will follow instructions under adult supervision.	low
Batteries	low	Safety advice will be given at the start of activity. The satellite features a flashing LED powered by powered by 2 AA batteries in a battery holder. Adults will ensure these are attached correctly before pupils operate their satellite model.	low
Screwdrivers	medium	Pupils will use small screwdrivers during the activity to attach wires and complete an electric circuit. Pupils will be advised on the safe use and transport of screwdrivers at the start of the activity.	low

6. Risk Identification: Incredible Edible Cell

Provider	**STEM Team East**		
Activity Description	**Incredible Edible Cell** Students make model cells from a range of sweets.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Allergies	high	Staff will be briefed at the start of the session about the safety requirements of the activity including awareness of allergies. Teachers will be advised of the resources and asked to assess suitability for any child in the class with an allergy. No nut based sweets will be used at any time.	low
Hygiene	low	Prior to the activity all sweets will be handled with gloves. They will then be stored in cleaned containers so they are fit for human consumption. Pupils will be asked to wash their hands both before and after this activity and surfaces will be cleaned with antibacterial spray.	low

7. Risk Identification: Aerodynamics and Drag

Provider	**STEM TEAM East**		
Activity Description	**Aerodynamics and drag in vehicle design using a wind tunnel.** Students learn about the friction force drag and how it affects vehicle movement and fuel efficiency. They then make a model vehicle, test it in a wind tunnel and make an assessment of the amount of drag generated using weights. Students then redesign their vehicle to minimise drag and re-test it in the wind tunnel.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Risk of trapped fingers, hair, clothing from fan in wind tunnel. Use of mains power.	low	The wind tunnel is designed so that it is not possible to access moving parts while the fan is running. However as a precautionary measure, ties must be tucked into shirts and students with long hair will be asked to tie their hair back. The wind tunnel will be connected to a circuit breaker and is PAT tested. All adult users will be briefed on the safe use of equipment prior to the activity.	low
K'Nex model vehicle	low	Pupils will make a model vehicle using K'Nex, a foam block and cardboard. Pupils will be provided with safety scissors and warned to take care using the paper to make their vehicles. The foam block will not be cut.	low
Trip Hazard	medium	All electrical cables will be securely attached to the floor to reduce the likelihood of people tripping over.	low

8. Risk Identification: Model Electric Car

9. Risk Identification: Cardboard Tech Car

Provider	**STEM TEAM East**		
Activity Description	**Model Electric Car / Cardboard Tech Car** Electric and Hybrid cars are now with us. Pupils will learn about these and cars of the future and the case for fuel efficiency and reducing our carbon footprint . They focus on the option of electric cars for sustainability and make their own model electric car with motor, switch, battery to revise their knowledge of electric circuits.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Trip Hazard	medium	All electrical cables will be securely attached to the floor to reduce the likelihood of people tripping over.	low
Hot Glue Gun	medium	Hot glue guns will be used by adults only in a designated area away from the main build area. Pupils will be warned that the glue is hot and not to touch the glue until it has fully cooled down.	medium
Batteries	low	Safety advice will be given at the start of activity. The cars are powered by 2 AA batteries in a battery holder and adults will ensure these are attached correctly before pupils operate their cars.	low
Electric Circuit	low	Pupils will make an electric circuit using a motor, wires, batteries and battery holder. They will follow instructions under adult supervision.	low
Screwdrivers	medium	Pupils will use small screwdrivers during the activity to attach wires and complete an electric circuit. Pupils will be advised on the safe use and transport of screwdrivers at the start of the activity.	low
Fast moving propeller or driving wheel	medium	The cardboard tech car is propeller driven. Pupils will be asked to ensure their propeller is firmly attached to the motor shaft so it does not fly off and injury anyone. The model electric car is driven by a wheel attached to the motor shaft. This wheel is attached using glue from a hot glue gun. The adult attaching this will ensure that the wheel is firmly glued on to prevent the wheel flying off during operation and hitting someone or something.	low

11. Risk Identification: Meet the Medics

Provider	**STEM TEAM East / Papworth NHS**		
Activity Description	**Meet the Medics**. Find out how amazing our bodies are with healthcare professionals from Papworth.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Peak Flow Meter	medium	Pupils will record their peak flow rates by breathing into a peak flow meter. All pupils will be informed at the start of this part of the activity to stop if they feel unwell at any time. Pupils with asthma will be asked to have their inhaler with them or not complete this part of the activity. .	low
Exercise	medium	Pupils will use record their pulse using a pulse oximeter before and after 1 minute exercise. Pupils will be informed at the start of this part of the activity to stop if they feel unwell at any time. Pupils with asthma will be asked to have their inhaler with them or not complete this part of the activity. .	low

12. Risk Identification: Kitchen Science

Provider	**STEM TEAM East**		
Activity Description	**Acids and Alkalis- Chemistry in the Kitchen.** Pupils learn about the pH scale and identify acids and alkalis from among a selection of food ingredients and investigate how effective they are for cleaning coins.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Allergies	high	Staff will be briefed at the start of the session about the safety requirements of the activity including awareness of allergies. Teachers will be advised of the resources and asked to assess suitability for any child in the class with an allergy. No nut based liquids will be used at any time.	low
Food ingredients Cleaning liquids.	low	Pupils will test the pH of a range of cleaning liquids and food ingredients using pH paper. Liquids will include ketchup, vinegar, lemon juice, washing up liquid and bicarbonate of soda. Pupils will be advised not to taste any of the liquids and asked to wash their hands at the end of the activity.	low
Spills	medium	Any spills will be cleaned up immediately to prevent a slip hazard.	low

13. Risk Identification: Engineering Water, Mott MacDonald

Health & Safety Risk Assessment

Mott MacDonal

Project Title	Stem Fair 13th and 14th June 2012	**Project Number**	N/A
Project Manager*	Elizabeth Sharpe	**Project Director***	N/A
Work Activities	**Catchment walkover survey (walking on footpaths and across fields and taking notes)**		
	Stream flow gauging in small stream		

Hazard / Aspect (1)	Consequence / Impact (2)	Persons at risk (3)	Initial risk level (4)			If High risk, can the hazard be avoided? (5)	Control measures (6)	Residual risk level (7)			Responsibility for implementing (8)	Action complete (9)
			Severity	Likelihood	Risk Level	Y/N		Severity	Likelihood	Risk Level		
Wet surfaces	slips and falls	Staff and students	2	2	M		Clear up any spilt water ASAP, no running	2	1	L	MM Staff and students	
Chemicals	Chemical burns/illness/b	Staff and students	2	1	L		Spray bottles are brand new and pumps (for boreholes) are from hand soaps to ensure no contact with unknown chemicals	2	1	L	MM Staff	
Electric and water	Electrics shocks	Staff and students	2	1	L		Keep water away from any electrics	2	1	L	MM Staff and students	
ALSO NOTE H&S RISK ASSESSMENT FROM CLIENT												

14. Risk Identification: The science of butterfly colours

Provider	**STEM Team East**		
Activity Description	**Butterflies – The Science of Butterfly Colours and Environmental Science**. A fascinating talk on how butterflies have different coloured wings because of the science of light and colour , the butterfly life cycle and importance to plants and the environment. Pupils will make paper butterflies.		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Scissors, paper , pens	low	Pupils will be provided with safety scissors and warned to take care using the paper and pens to make their butterflies.	low
Pipe cleaners	low	Pupils will use pipe cleaners to join paper together to make their paper butterflies. They will be asked to take care with any sharp edges and bend these over to prevent injury.	low
Compass	low	Older students will be given the opportunity to use a pencil and compass to make their circle. Pupils will be warned to take care with the sharp end and will work under adult supervision. Compasses will not be left unattended on tables.	low

15. Risk Identification: Robotics

Provider	**STEM TEAM East**		
Activity Description	**Robotics - Systems and Control –Programming.** Using hexapod robot models , pupils get to understand 'truth tables ' and the basics of Information Technology as they program an IQ programmable integrated circuit, PIC, board to take the robots along a simple maze		
Who will be exposed to the hazards: School pupils and adults taking part in the activity.			
Hazard	Severity and Likelihood.	Control measures	Rating after control measures applied.
Batteries	low	Safety advice will be given at the start of activity. The hexapod robots are powered by 3 AA batteries in a battery holder and adults will ensure these are attached correctly before pupils operate the robot.	low
Screwdrivers	medium	Pupils will use small screwdrivers during the activity to attach wires from the hexapod robot to the IQ4 board. Pupils will be advised on the safe use and transport of screwdrivers at the start of the activity.	low

11. Risk Identification: Scott Polar Research Institute

12. Architecture: Micheal Foex

External providers – Risk Identification documents to be provided shortly.