**Activity Safety Form**

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| **Program:** | jrDEEP Summer Academy |
| **Course Title:** | Cool Code |
| **Instructor(s):** | Connor Smith, Anastasiya Martyts |
| **Season:** | Summer |
| **Year:** | 2014 |
| **Project/Activity Name:** | Mouse and Keyboard with PyGame |
| **Source:** |  |
| **Grade Level:** | 5-6 |
| **Topics Covered By Activity:** | Mouse and Keyboard Events with PyGame |
| **Objective (Learning Outcomes):** | To be able to detect mouse and keyboard input and perform tasks according to that input |
| **Safety Approval Date:** |  |

Please identify specific safety hazards in the table below

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| **Check if applicable** | **Hazard** | **Why is this required?** |
|  | Electricity |  |
|  | Open Flame |  |
|  | Projectiles |  |
|  | Natural Gas |  |
|  | Compressed Air |  |
|  | Glassware |  |
|  | Dissection Equipment |  |
|  | Biological Material/Specimen |  |
|  | Chemicals |  |
|  | Tools (ex. soldering iron, hacksaw, drill)  **Please specify in the materials list** |  |
|  | Other: |  |

Safety Materials/P.P.E. Required for this Activity

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| --- | --- | --- |
| **Check if Required** | **Safety Material/Personal Protective Equipment (P.P.E.)** | **Explanation (Specify when this is required i.e. is this during preparation and/or while the activity is taking place and who wears/uses the piece of P.P.E. i.e. Instructor, student etc. please be explicit)** |
|  | Goggles |  |
|  | Lab Coats |  |
|  | Nitrile Gloves |  |
|  | Table Coverings |  |
|  | Fume hoods |  |
|  | Biosafety Cabinets |  |
|  | Spill Kits |  |
|  | Disposal Mechanisms (ex. broken glass, biologics, chemicals) |  |
|  | N95 Masks |  |
|  | Other: |  |

**Background Information:**

The mouse and keyboard have both become integral parts of using the modern computer. However, both of these pieces of hardware are both very old: the keyboard was invented with the advent of the typewriter, although the first electronic keyboard wasn’t used with a computer until the 1970s. The mouse is actually older, having been invented by the military in 1946 but not becoming popular until the advent of personal computers in the late 1960s

Since this hardware combination is so old and have not been significantly changed since, the signals they send to the computer are also quite simple. A keyboard only sends a binary number to the computer whenever a key is pressed or released. A mouse sends signals when it detects movement or a mouse button is pressed or released.

**Processing Signals with PyGame**

Since the signals sent by the hardware are so simple, the processing of them is also quite simple. To check what signals have been sent to the computer, you call the following function from PyGame:

*pygame.event.get()*

This will return a list of ‘events’ that they computer has received since the function was last called. After being called, all those stored functions are lost unless they are manually stored in a variable. After storing all of these events in a variable, you can iterate through all of the received events and perform the desired actions with if-statements. For example:

*for event in pygame.event.get() :*

*if event.type == pygame.KEYDOWN :*

*if event.key == pygame.K\_SPACE :*

*print "Space bar pressed down."*

*elif event.key == pygame.K\_ESCAPE :*

*print "Escape key pressed down."*

*elif event.type == pygame.KEYUP :*

*if event.key == pygame.K\_SPACE :*

*print "Space bar released."*

*elif event.key == pygame.K\_ESCAPE :*

*print "Escape key released."*

As shown above, there are 4 main types of events: KEYDOWN, KEYUP, MOUSEBUTTONDOWN and MOUSEBUTTONUP. You can also get relative movements (ie mouse was moved to the right) by MOUSEMOTION

**Procedure:** (Please detail **all** the steps required to complete this project/activity. State what will be done by instructor(s), counselor(s) i.e. certain steps, entire demonstration, etc. and what will be done by your students. Outline any Safety procedures required due to location/venue of activity.)

1. Discuss the role of the mouse and keyboard in computers
2. Demonstrate a simple ‘you pressed \_\_\_\_’ program and walk the campers through the method of getting input from the keyboard/mouse
3. Write on the board the different events and how to interpret them
4. Have the campers write a program which displays the events from the keyboard/mouse
5. Bonus: Write a piano program, where the middle row of the keyboard (ASDFGHJKL;’) translates into key notes
   1. unfortunately the Raspberry Pis do not have the capabilities for sound but explain what code would need to be added to actually play the sounds

**Student Take Home/Materials Kept:**

**None**

Materials **(Please include all materials including consumable items, tools, stationery, arts & craft supplies, chemicals, biologics, etc.).** Please identify (in the notes column) any hazardous materials PRODUCED as a result of the project/activity.

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| **Item** | **Quantity** | **Purpose in Activity** | **Route of Transmission** | **Anticipated Health Risk** | **Safety Precautions** | **Storage/Disposal Arrangements** | **Notes** |
| Raspberry Pi | 1 Each | Programming |  | Tripping on power cords | Cable organization, tape cables to floor if necessary |  |  |
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Use the below chart to inform how you fill out various sections of your Activity Safety Sheet.

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| Anticipated Health Risks (Use the following relevant descriptions in the materials table) | | Safety Precautions (Use these and other descriptions the show how you will specifically address each of the safety precautions mentioned on the left side of this table.) | |
| 1 | Materials are sharp and may cut skin (Utility Knives, Scalpels, Scissors) | 1 | Instructors will advise on the appropriate use of materials (for 1-10 above) |
| 2 | Materials may poke or pierce skin (Wooden Skewers, Sticks) | 2 | Instructors will review the MSDS for materials prior to and during the activity (3-8) |
| 3 | Materials are toxic if ingested (Chemicals such as Bleach, Detergents, Indicators) | 3 | Participants will wear dust or N95 masks at all times (4 and 5) |
| 4 | Materials are hazardous if inhaled (Chemicals, Powders, Dust, Solder) | 4 | Participants will wear nitrile gloves at all times (6) |
| 5 | Materials are an irritant to lungs (Chemicals, Powders, Dust) | 5 | Participants will wear goggles at all times (7) |
| 6 | Materials are an irritant to skin (Chemicals, some Soaps, Allergens) | 6 | Students will be instructed on the use of the eye station in-lab (7) |
| 7 | Materials are an irritant to eyes (Chemicals, Powders, Dust) | 7 | Instructors will have a fire extinguisher within arm’s reach while performing activity (8) |
| 8 | Materials are flammable/Use of Open Flame (Alcohol, Gases, Fuels, Matches) | 8 | Instructors will establish a safety perimeter of 5m while performing the activity/during testing (8 and 10) |
| 9 | Participants may present serious allergies (Nuts, Shellfish, Milk, Eggs, Fruits, Food Colouring) | 9 | Instructors will review student allergies prior to commencing activity (9) |
| 10 | Materials are or can be involved as projectiles (Rocks, Golf Balls, Rockets) | 10 | Instructors will advise of any hidden allergens (9) |
| 11 | Materials present a slipping hazard if spilled | 11 | Instructors will monitor participants for indications of an allergic reaction (9) |
| 12 | Materials are hot and may burn skin. (glue guns, soldering irons) | 12 | Instructors will review the procedure with students, prior to testing (1-10) |
|  |  | 13 | Instructors will explain any necessary emergency protocol (always) |
|  |  | 14 | Instructors will debrief and discuss any sensitive issues before, during and after the activity (always) |
|  |  | 15 | Only Instructors with training will complete the specified activity or demo always. |
|  |  | 16 | Spill Clean up kit provided (11) |
| Routes of Transmission | | Questions to ask about your Materials and Activity (Address any that are relevant in your above Activity Safety Sheet) | |
| 1 | Eyes | 1 | Are there any ethical concerns regarding your workshop? |
| 2 | Skin contact | 2 | Are there any sensitive issues or activities? |
| 3 | Inhalation | 3 | Are there safety concerns if specific procedures are not followed? |
| 4 | Ingestion | 4 | Do any of the materials have an MSDS? |
| 5 | Other (please specify) | 5 | Do any of the materials or activities require special training? |
|  |  | 6 | Questions to ask about your Materials and Activity (Address any that are relevant in your above Activity Safety Sheet) |