# SSERC logo

**SSERC Risk Assessment** (revised version March 2018)

(based on HSE’s INDG 163 ‘Risk assessment - A brief guide to controlling risks in the workplace’)

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| Activity assessed | Methane Rocket |
| *Date of assessment* | 30th June 2020 |
| *Date of review (****Step 5****)* |  |
| *School* |  |
| *Department* |  |

| Step 1 | Step 2 | Step 3 | Step 4 | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *List Significant hazards here:* | *Who might be harmed and how?* | *What are you already doing?*  *What further action is needed?* | *Actions* | | | | |
| *by whom?* | | *Due date* | | *Done* |
| Methane is extremely flammable and methane/air mixtures are explosive. (between 5% and 15%) | Teacher / technician preparing bottle  Teacher can be harmed by bottle exploding. | Ensure there are no sources of ignition in the vicinity other than the ignition system.  Surround the ‘launch site’ with safety screens.  Only use PET bottles.  Do NOT use a bottle larger than 600cm3  Ensure correct ratio of gases is used. |  |  | |  | |
| Teacher can be harmed if bottle catches fire | Have fire blanket to hand. |  |  | |  | |
| Teacher / pupils can be injured by the bottle or by pieces of plastic of the bottle explodes | Teacher and pupils all to wear safety spectacles / goggles.  Pupils should be positioned to the side / rear of the ‘launch site’ |  |  | |  | |
| Teacher / pupils may suffer damage to hearing as a result of the very loud bang | Pupils should be warned to put fingers in their ears.  Teacher (who is closer) should wear ear plugs, ear phones or ear defenders to protect his/her hearing. |  |  | |  | |
| Possible damage can be done as a result of the rocket impact | The target area should be checked for breakable items etc. The bottle can travel over 10 m |  |  | |  | |

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| **Description of activity:**  A 0.5 litre soft-drink plastic bottle is filled with two thirds its volume of oxygen and one third methane. The screw top is replaced. The bottle is laid on a suitable ‘launch pad’, the screw top is removed and the gas mixture is ignited with a lighted taper (or any other suitable means). The bottle is projected across the room.  With an appropriate measuring cylinder, use water to find the volume of the bottle. Place a mark on the side of the bottle at one third and two thirds of the volume.  • Prepare pure oxygen chemically or use a cylinder.  • Pass oxygen into the bottle (inverted and filled with water in a trough), so that two thirds  of the bottle is filled with oxygen.  • Now pass methane from a natural gas tap to fill the rest of the bottle.  • Replace the cap on the bottle. |
| **Additional comments:**  As with all risky demonstrations it is essential that the teacher practices this demonstration before trying it in front of the children.  Teachers in adjoining rooms should be warned that there will be the noise of an explosion.  The demonstration could be performed outside the laboratory. However, another adult will be required to supervise the students. Any demonstration outdoors will cause disruption to other lessons, because students will watch from adjacent rooms.  Warn pupils **not** to carry out this activity at home. |