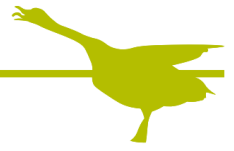# Gassed Out Solution

Faculty: Environment

As a first step, identify as many of the images as possible. Twelve of the images are related to mythology (e.g., Triton, Atlas) and four are related to Shakespeare (e.g., Juliet, Prospero). The complete list decoded is given on the next page.

These names are all names of satellites of the planets Jupiter, Saturn, Uranus, and Neptune. The four images at the bottom of the puzzle are also meant to clue that the images will fit into four categories and once those categories are realized, it should be clear that the final four images are crude depictions of the Jovian planets.

Once the actual names have been established, we observe that below each image is the satellite name ciphered in some way (which we'll figure out later). We also observe that each ciphered name contains an uppercase letter. Reading the corresponding deciphered letters gives the message "GET LABELS DO MATHS".

The Labels are roman numerals assigned to each satellite and can be looked up on Wikipedia or elsewhere. For example, the satellites of Jupiter have labels 8 (Pasiphae), 13 (Leda), 16 (Metis), and 24 (Iocaste). We next observe that each image has a "+" or "-" sign overlay. These tell us how to do math with these numbers. For example, for Jupiter we have (+8)+(-13)+(-16)+(+24) = 3. The satellite of Jupiter with Label 3 is **GANYMEDE** and we observe that this name has the correct number of letters to fill the spaces below the image of Jupiter. Repeating this process for the other three planets give **HYPERION**, **TRINCULO**, and **PROTEUS**.

The words below each picture originally presented are ciphered, so we must cipher these new satellite names before entering them. Comparing the actual image satellite names to the given ciphered names, we can infer that a substitution cipher has been used since repeated letters are always map the same way. However, the same cipher has not been used for every satellite. But the same cipher has been used for each group corresponding to the same planet. One might also observe that letters towards the end of the alphabet are usually unchanged (e.g., 'x' always maps to 'x', 'y' always maps to 'y'). At this point, one might guess (correctly) or do a bit more work to find that a simple keyword cipher has been used for each group where the host planet name is the keyword. For example, to encode satellite names for Jupiter, the following mapping is used:
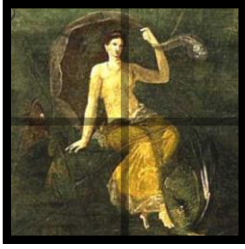
```
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
J U P I T E R A B C D F G H K L M N O Q S V W X Y Z
```

Finally, we now encrypt each new satellite name and enter them into the spaces provided below each planet image. Reading the resulting encrypted letters in the numeric order indicated spells out the solution: **HALOED SMOG**

Gassed Out Solution
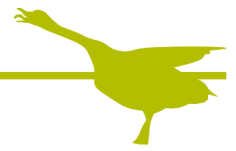
Faculty: Environment

Galatea

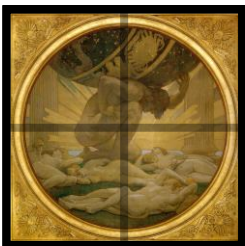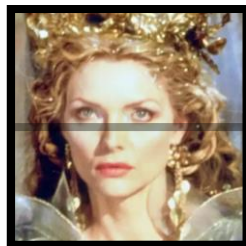pasiphaE

triTon

juLiet

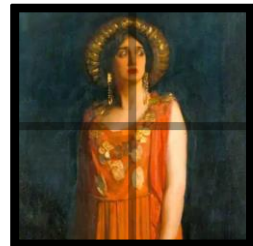sycorAx

phoeBe

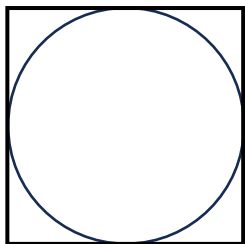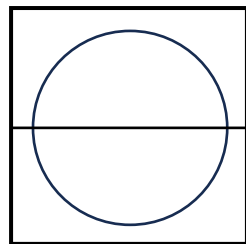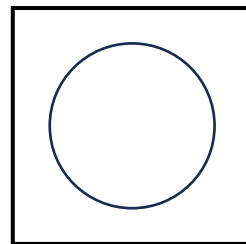psamathE

Larrisa

enceleduS

leDa

prOspero

Metis

atlAs

Titania

tetHys

iocaSte

_ _ _ _   _ _ _   _ _ _ _   _ _ _ _ _ _
1   10   8 6   9 5   2   3 4   7

KEY CLUES

2023