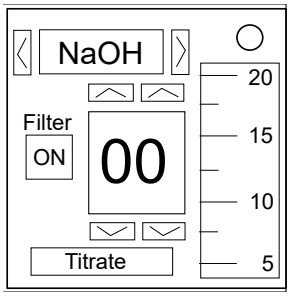

On the Subject of Neutralization

The rules are simple: neutralize or be neutralized.

- The module is disarmed by successfully neutralizing an acid contained in a tube by titrating it with a chemical base.
- In order to solve the module, the type of base, amount of base, and filter state must all be correct.
- Once the appropriate conditions are set, press "Titrate" to confirm the solution.
- An inccorect input yields a strike. The correct answer remains unchanged.
- Useful info may be found in **Appendix NT27: Chemical Information.**

Determining Titrants

The acid type can be determined using the following chart:

Solution Color	Acid Type
Red	Hydrogen bromide
Yellow	Hydrogen fluoride
Green	Hydrogen chloride
Blue	Hydrogen iodide

The base that must be used to titrate can be determined via the following ruleset:

- If the bomb has an NSA indicator and exactly 3 batteries, add ammonia.
- Otherwise, if the bomb has a lit CAR, FRQ, or IND indicator, add potassium hydroxide.
- Otherwise, if the bomb has no ports and the serial number has a vowel, add lithium hydroxide.
- Otherwise, if the acid's chemical formula has a letter in common with an indicator present on the bomb, add potassium hydroxide.
- Otherwise, if the number of D batteries is greater than the number of AA batteries, add ammonia.
- Otherwise, if the anion's atomic number is less than 20, add sodium hydroxide.
- Otherwise, add lithium hydroxide.

Determining Concentrations

The concentration of the acid can be determined via the following process:

- Start with the atomic number of the anion of the acid.
- Subtract the atomic number of the cation of the base.
- If the anion or cation has a vowel in the chemical symbol, subtract 4.
- If the anion and cation's chemical symbols have the same number of characters, multiply by 3.
- Take the least significant digit of the result (removing negative signs).
- If the number is 0, the number becomes the volume of acid doubled then divided by 5.
- Divide by 10. This is the concentration of the acid.

The concentration of the base can be determined via the following ruleset:

- If there are more battery holders than port types or indicators, the concentration is 5.
- If there are more port types than battery holders or indicators, the concentration is 10.
- If there are more indicators than battery holders or port types, the concentration is 20.
- If there are any ties for the most, the concentration is either 5, 10, and 20, whichever is closest to the cation's atomic number.
- However, if the titration combination is HI and KOH or HCl and NH_3, the concentration is always 20.

Determining Drop Count

- Start with 20 and divide by the concentration of the base.
- Multiply by the volume of acid and concentration of the acid.
- The result is the number of drops required to successfully titrate.

Determining Solubility

- If the module's acid/base combination on the following chart has "NS" for "Not Soluble", the filter must be turned ON before the base is added.
- Otherwise, the filter must be turned OFF.

	NH_3	KOH	LiOH	NaOH
HBr	S	NS	NS	S
HF	NS	S	NS	S
HCl	NS	NS	S	NS
HI	S	S	S	NS

APPENDIX NT27: Chemical Information

NT27.1: Bases

Name	Chemical Formula	Cation	Chemical Symbol	Atomic Number
Ammonia	NH_3	Hydrogen	H	1
Lithium hydroxide	LiOH	Lithium	Li	3
Sodium hydroxide	NaOH	Sodium	Na	11
Potassium hydroxide	KOH	Potassium	K	19

NT27.2: Acids

Name	Chemical Formula	Anion	Chemical Symbol	Atomic Number
Hydrofluoric acid	HF	Fluorine	F	9
Hydrochloric acid	HCl	Chlorine	Cl	17
Hydrobromic acid	HBr	Bromine	Br	35
Hydroiodic acid	HI	Iodine	I	53