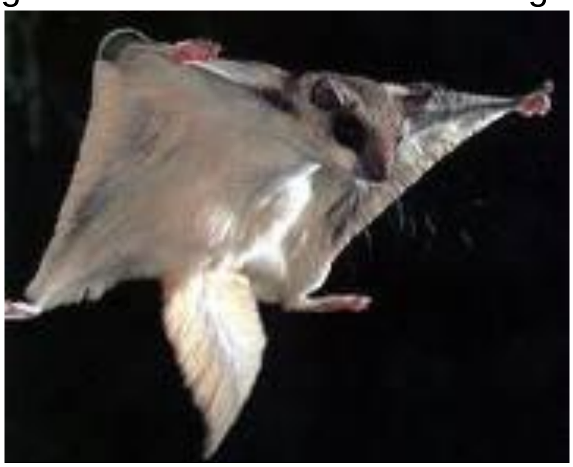
Emolga: A Scientific Study of the Amazing Sky-Squirrel Pokemon

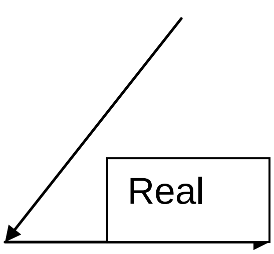
Part 1: Basic structure of Emolga and it's comparison to a real flying squirrel

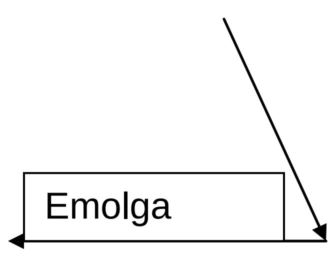
Emolga is similar to a flying squirrel. It has a thick membrane that enables it to glide in the air. If Emolga were classified into the animal classification system of today, it would be classified in one of sixteen genera. The membrane of Emolga is simply a thick flap of skin.



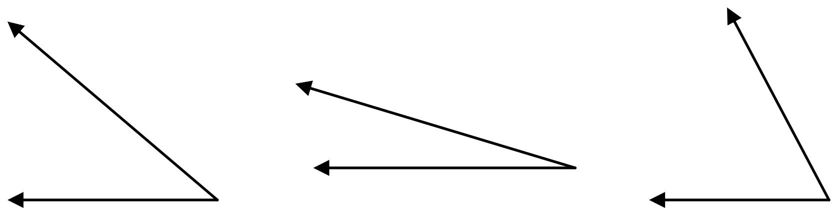
The pictures above show Emolga compared to a real flying squirrel. At a first glance, there is a somewhat large difference. Notice that the real flying squirrel's membrane includes its whole body while Emolga's membrane only includes its upper body, meaning only its arms. Also, Emolga has a thin tail resembling a tail feather of a bird, which gives it more control in the air.

Part 2: Geometry of the angle-of-flight of Emolga and how it compares to a real flying squirrel





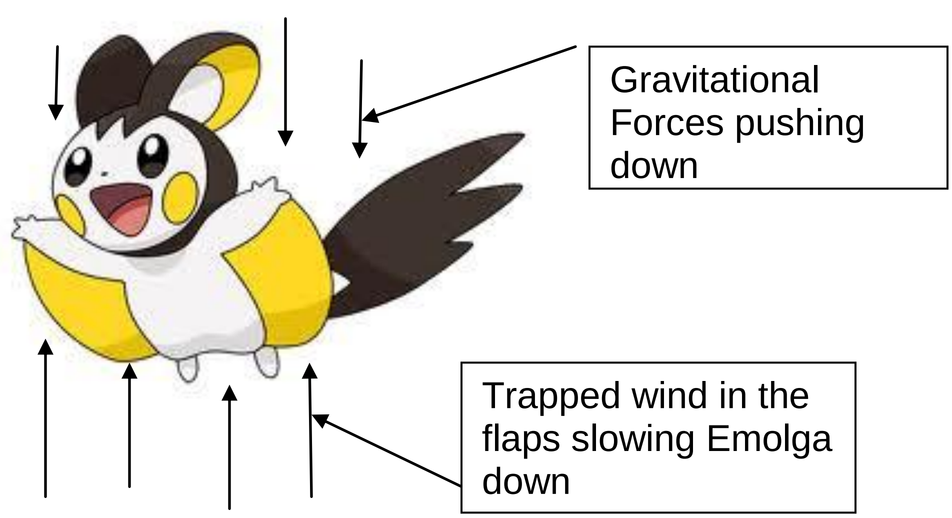
The angles shown above are representation of the angles-of-flight in a real flying squirrel (left) to an Emolga (right). The angles are almost similar but not quite. The flight angle of an Emolga is actually larger than that of a real flying squirrel. If the angle-of-flight is smaller, then the gliding speed going down will be slower thus allowing more control during descent/semi-flight. If the angle-of-flight is larger (preferably 45-70 degrees) the gliding speed will be faster thus less control in the air.



The three angles shown above are angles of flight used by Emolga and the flying squirrel. Angle 1 (far left) offers a balance of speed and control. It is well balanced for medium distance flights. Angle 2 (Center) is used for long distance flights that require low speeds for better control while in the air. Angle 3 (far right) is used for very short distance flights. It offers huge speeds but it also requires more accuracy and precision

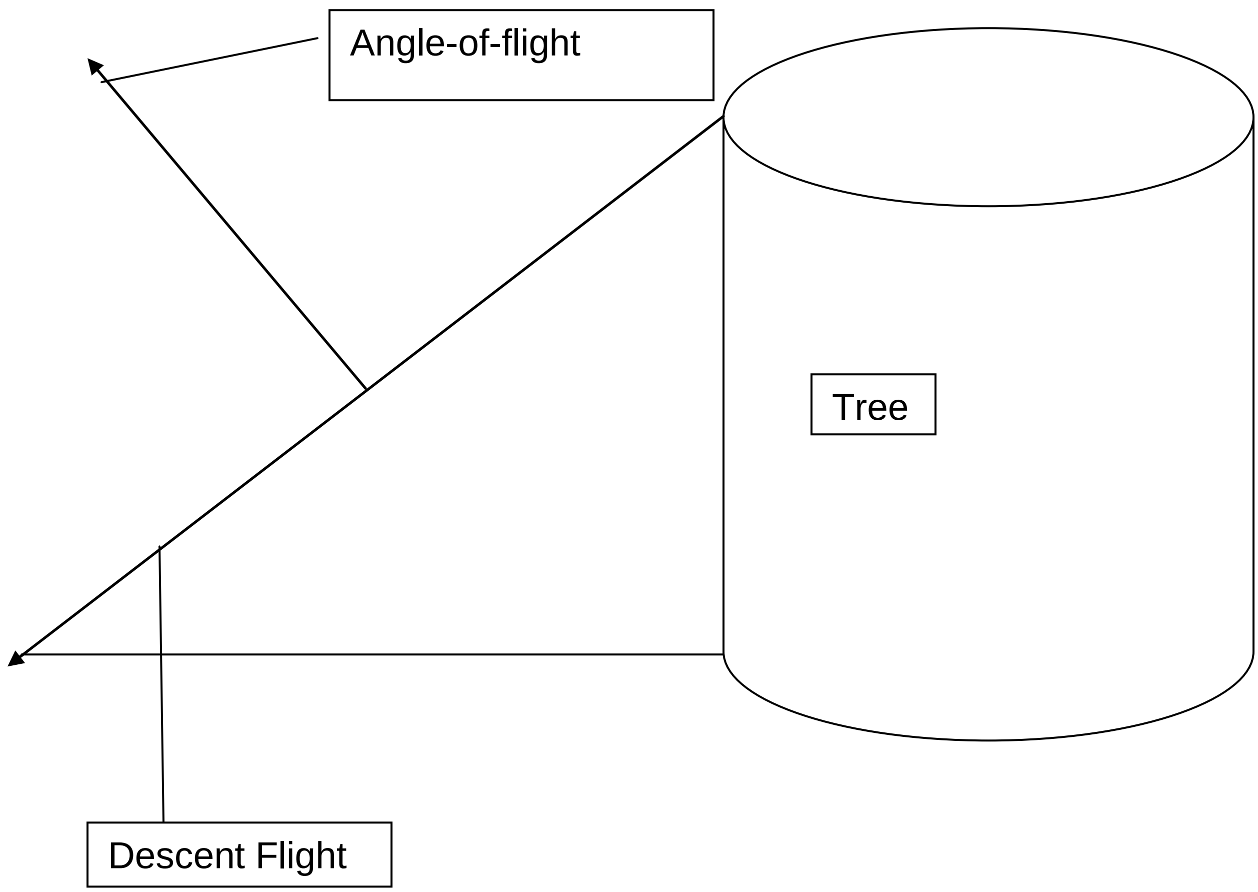
Part 3: Physics of the flight of the flying squirrel and Emolga

The physics of the flight of the flying squirrel and Emolga are the same, exept the tail feather of Emolga offers more control.



The diagram above shows an Emolga in flight. As the gravitational forces pull Emolga down to the ground, the air beneath it gets trapped in the flaps of skin slowing Emolga down. The angle-of-flight is a contributor to how much air gets trapped in the flap of skin. The smaller the angle-of-flight, the more air gets trapped in the flaps of skin thus giving the Emolga better control in the air. On the other hand, the larger the angle-of-flight, the less air gets trapped in the flaps of skin thus drastically lowering the control in flight but drastically increasing the speed.

Although the angle-of-flight contributes to the speed of flight and descent, the speed is always increasing. However, the angle-of-flight determines how fast the speed increases.



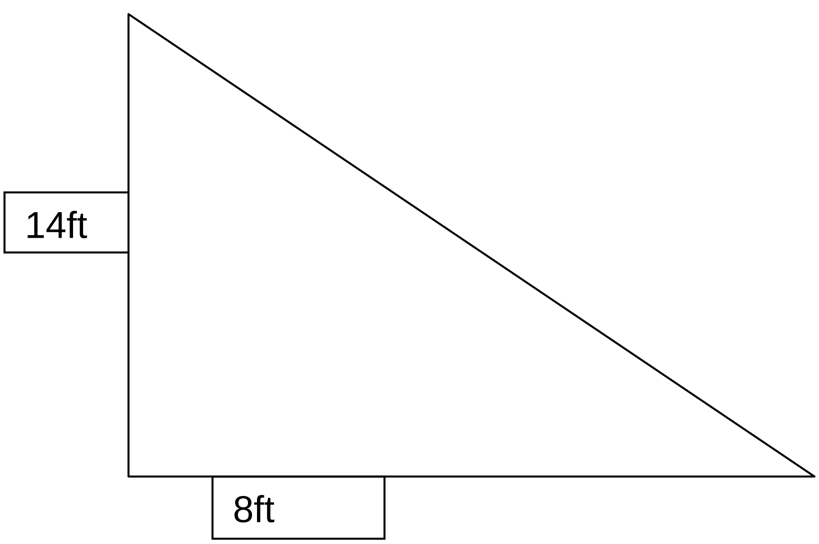
The illustration above shows the descent of an Emolga. Notice that the angle-of-flight creates supplementary angles with the flight descent. The angle-of-flight will always be supplementary with the angle-of-descent.

Part 5: Formulae of the Physics of Emolga

In terms of Emolga, the descent speed will be measured in meters/second such that: $S = \frac{D+\frac{1}{2}a}{T}$. The time is measured in seconds and the angle-of-flight is in degrees. D is for distance and the small A is for the angle-of-flight. This problem can be manipulated to find time, distance or angle-of-flight.

If an Emolga was in flight for 5 seconds and it covered 10 feet at a 30-degree angle, substituting the numbers would get: $S = \frac{10+\frac{1}{2}30}{5}$. The Emolga would be going 5 meters/second. The formula can also be manipulated for other purposes.

The Pythagorean Theorem can be used to find the distance.



An Emolga is up in a tree 14 feet up. The distance from a pasture is 8ft away. The descent distance must be found using the Pythagorean formula: $a^2 + b^2 = c^2$. Substituting the values we can solve to find the descent distance: $8^2 + 14^2 = c^2$, $64 + 196 = c^2$, $260 = c^2$, $\sqrt{260} = \mathrm{c}$, $16.1 \sim \mathrm{c}$. The descent distance is approximately 16.1 feet.

Part 6: Experiments based on the flight of Emolga and the formulae based on the results

The main experiment performed was taking an Emolga into a vertical wind tunnel. The voltage of the fan was unknown, but the fan was able to produce 10,000 pounds of force, which is able to tip over a bus. The experiment was that a certain amount of force would keep an Emolga at a certain height. An average Emolga weighs about 13 pounds. Therefore, for every factor of 13, an Emolga will rise 1 foot. If the fan were exhibiting 52 pounds of force, the Emolga will be 4 feet in the air. In addition, the Emolga was weighted down with weight vest ranging from 1-8 pounds. The table below shows the results of the experiment. The formula following the table shows how to get the height if weight were added.

Test Number	Weight added	Force of Fan in pounds	Height in feet
1	0	13	1
2	0	26	2
3	0	39	3
4	0	52	4
5	0	65	5
6	0	78	6
7	0	91	7
8	0	104	8
9	0	117	9
10	0	130	10
11	1	156	11
12	2	182	12
13	3	200	≅12.4
14	6	215	≅10.5
15	5	168	≅7.5
16	5	169	8
17	7	198	≅8.2
18	4	216	≅12.6
19	2	279	≅19.6
20	8	300	≅15.1

$$H = \frac{F}{W} - w$$

The formula above shows how to get the height, if an Emolga was weighted. The uppercase w represents the initial weight of the Emolga while the lowercase w represents the weight added. Taking the 11th test and plugging in the numbers would get:

$$H = \frac{156}{13} - 1$$
$$H = 12 - 1$$
$$H = 11$$

Part 7: Further explanation of the physics of Emolga in how it relates to the experiment performed

The experiment performed showed that for every 13 pounds, Emolga rises 1 foot. Because of the flaps on Emolga's body, some of the air produced by the fan became trapped in the flaps. The result was lift. As the force of the fan increased, more air became trapped and Emolga continued to rise into the air. However, as weight was added to Emolga, it took more air to produce the same amount of height as if Emolga did not have any additional weight. In order to find the highest height that an Emolga can reach, the maximum force of the fan must be divided by the weight of Emolga. Therefore, we get: $H = \frac{F}{W} - w$, $H = \frac{10{,}000}{13} - 0 \cong$ 769.2 feet.

When the Emolga reached maximum height, the fan's force was lowered gradually. This resulted in the Emolga descending slowly. As the fan's force decreased, the Emolga's angle-of-flight did not change. For every 13 pounds of force lost, Emolga descends one foot. Therefore the ratio of pounds of force to feet rose is 13:1. The same ratio can apply to people who have worn flying squirrel suits. If a man weighs 120 pounds, then the ratio would be 120:1. Therefore, it would take 120 pounds of force to lift the man one foot in the air.

Part 8: Conclusion

Emolga is one of the most amazing pokemon ever discovered. Emolga is indeed a flying squirrel in all its kind. It can soar from one place to the next. With simple adjustments to its angle-of-flight, it can adapt to many flight scenarios. Emolga is just another discovery that has fascinated mankind, yet there are still many more discoveries waiting to explore.