

## Timing

- \* Duration of events
- \* Indicates much about action and changes our perception of it.
- \* Especially character movement.
- \* Example of a character moving its head.
  - \* Key 1: Looking downwards over right shoulder.
  - \* Key 2: Looking upwards over left shoulder.

## Inbetweens      Visual Result

- 0      Tremendous force, head almost ripped off! - *unlikely usage.*
- 1      Hit by a brick, rolling pin, frying pan.
- 2      Nervous tick, spasm, twitch.
- 3      Dodging something.
- 4      Giving an order, shouting "Oi!", "Get off!"
- 5      Forcible request, "C'mon!"
- 6      Turning head to stare, someone sexy, small object of desire.
- 7      Taking a good hard look.
- 8      Following something. Scanning, searching for something.
- 9      Lifting the head as a gesture of thought.
- 10     Moving a sore neck.

\* These timings are based upon film projection rates of 24fps.

\* Exposures made on "twos".

## Ones, Twos and Threes

- \* **"Ones"**      One image per frame exposed.
- \* **"Twos"**      One image for every two frames exposed. (Normal)

\* **"Threes"** One image for every three frames exposed.

\* Reasons for exposure on **"twos"**:

\* Smooth animation can still be seen with 12 inbetweens per second (resulting projection rate is still 24 frames for film, 25 frames I 50 fields for tv).

\* Saves the amount of drawing required.

\* Reduces rendering times.

\* Increases lead time to completion of the project.

\* Cel animated characters move more lively.

\* Larger break down distances for hand crafted in-between positions are easier to handle than the smaller distances required for ones.

\* Use of ones may result in no visually smoother animation due to small distances between in-between outlines.

\* When to use **"ones"**:

\* Computer animation

\* When objects move large distances across the screen

\* Cel classical animation

\* When character animated over a moving background that is animated on ones. The background will "slip" behind the character.

\* When complex camera moves are made.