



12 Principles of Animation



WHAT ARE THE 12 PRINCIPLES OF ANIMATION?

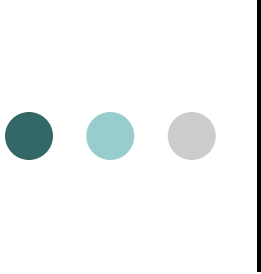
- Disney's 12 principles of animation were introduced by the animators Ollie Johnston and Frank Thomas in their book *The Illusion of Life: Disney Animation*, which was first published in 1981.
- Through examining the work of leading Disney animators from the 1930s onwards, Johnston and Thomas boiled the studio's approach down to 12 basic principles of animation.
- These principles came as a result of reflection about their practice and through Disney's desire to devise a way of animating that seemed more 'real' in terms of how things moved, and how that movement might be used to express character and personality.

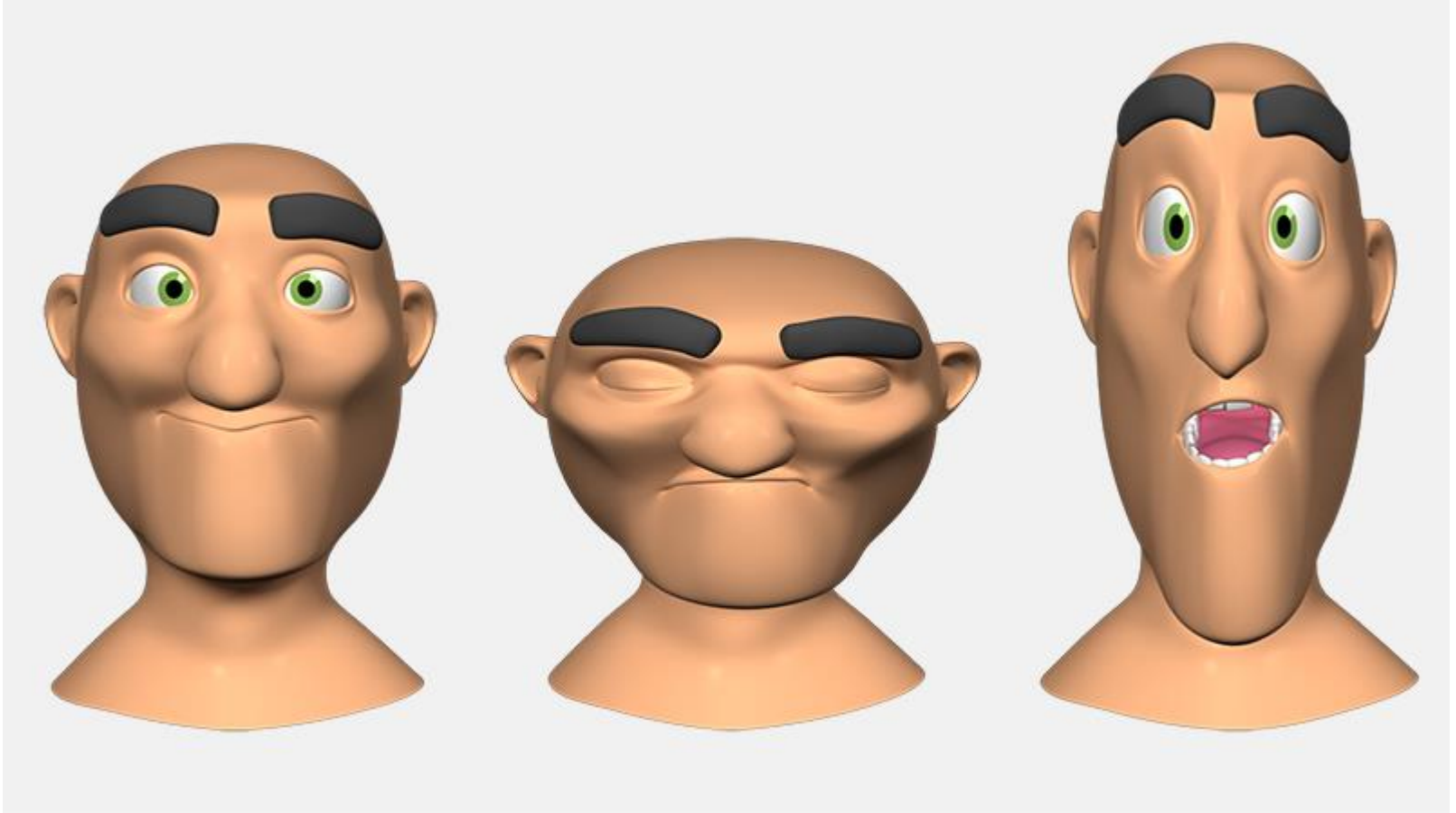


1. SQUASH AND STRETCH

- The squash and stretch principle is considered the most important of the 12 principles of animation.
- When applied, it gives your animated characters and objects the illusion of gravity, weight, mass and flexibility.
- It is used in all forms of character animation from a bouncing ball to the body weight of a person walking.
- Think about how a bouncing rubber ball may react when tossed into the air: the ball stretches when it travels up and down and squishes when it hits the ground.



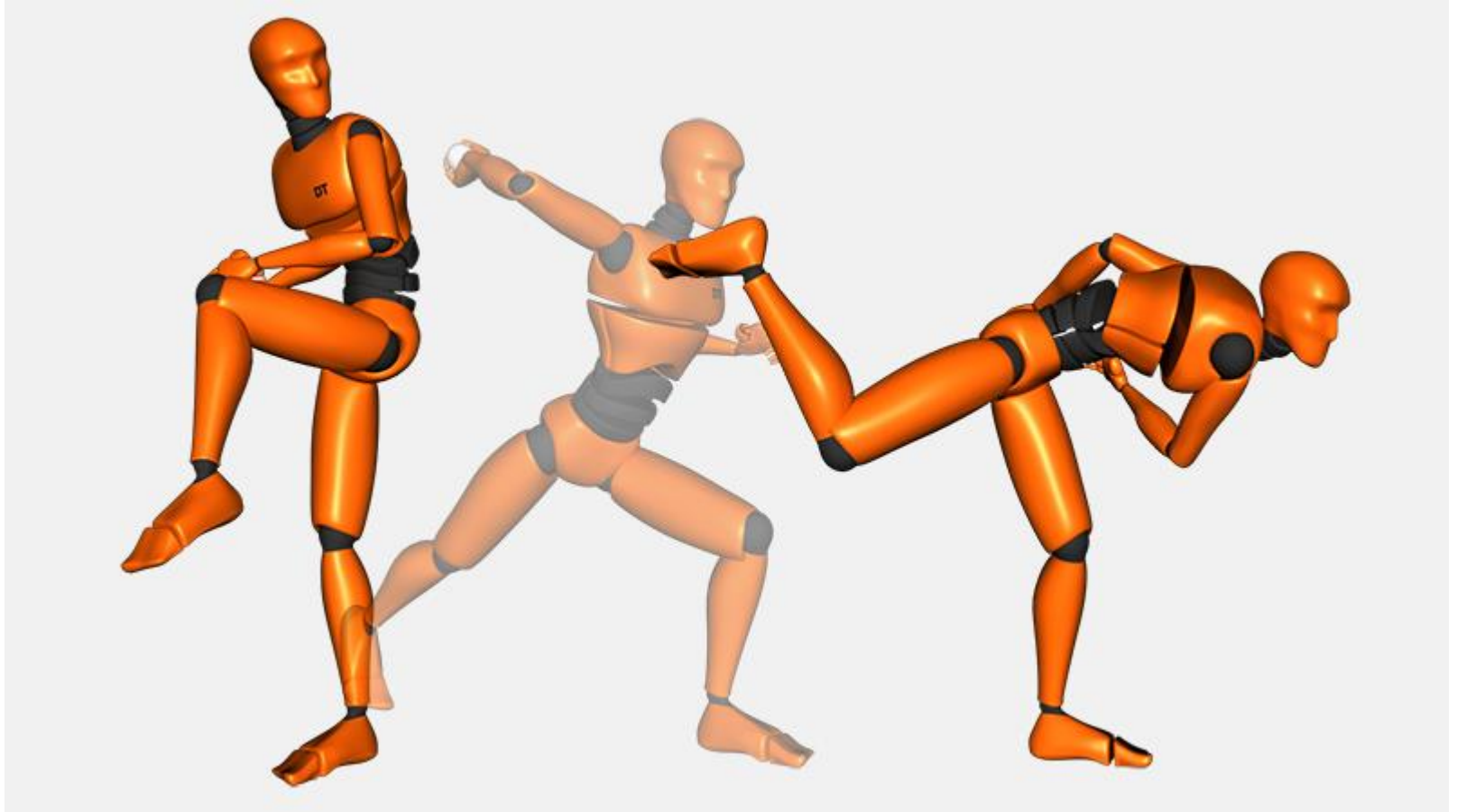
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- When using squash and stretch, it's important to keep the object's volume consistent. So when you stretch something it needs to get thinner, and when you squash something it needs to get wider.
 - There's a lot of squash and stretch happening in real life that you may not notice.
 - For instance, there's a lot of squash and stretch that occur in the face when someone speaks because the face is a very flexible area.
 - In animation, this can be exaggerated.
 - Squash and stretch can be implemented in many different areas of animation to add comical effect or more appeal, like for the eyes during a blink or when someone gets surprised or scared.

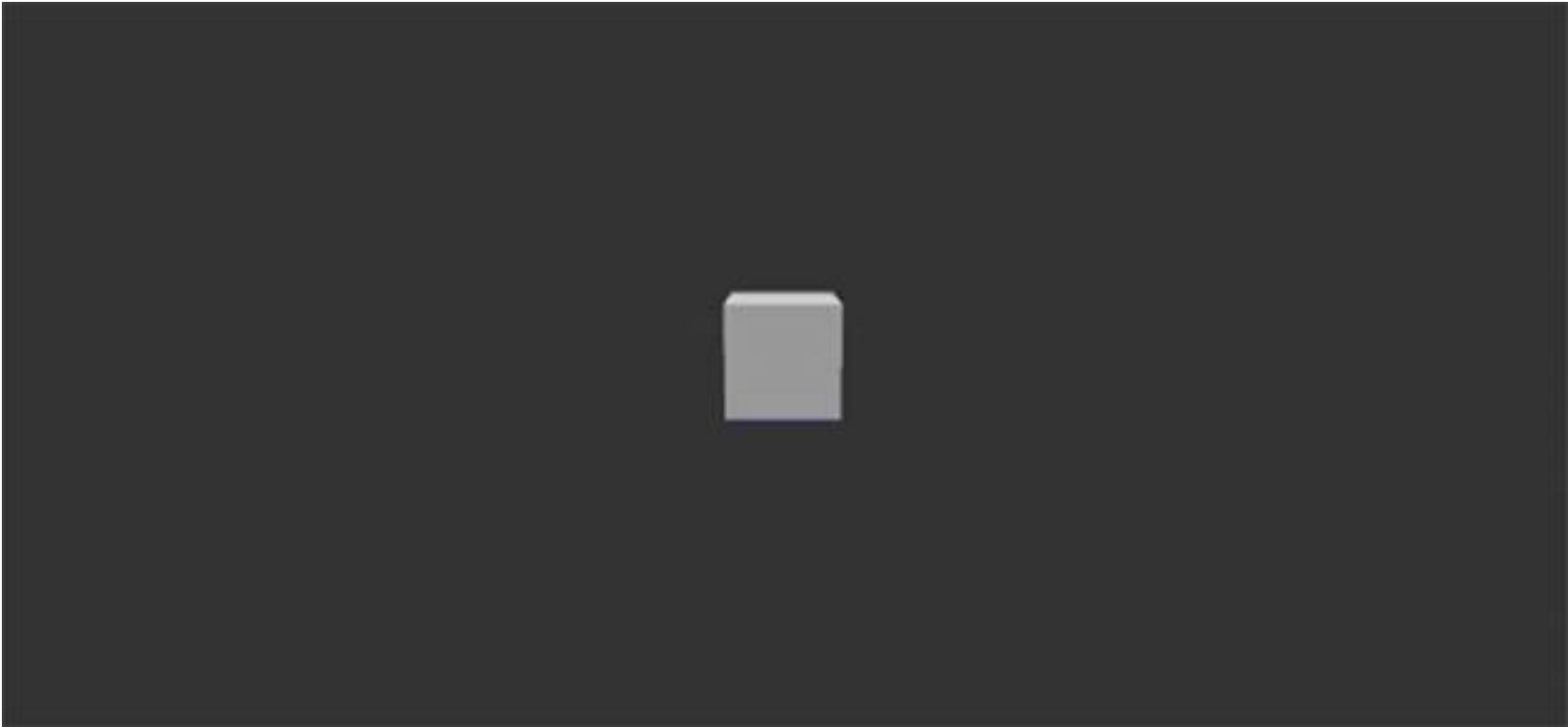




2. ANTICIPATION

- Anticipation is used in animation to set the audience up for an action that is about to happen, such as, starting to run, jump or change expression.
- It has the effect of making the object's action more realistic.
- A backwards motion occurs before the forward action is executed and the backward motion is the anticipation.
- Consider how it might look if you were to jump in the air without bending your knees, or perhaps to throw a ball without first pulling your arm back. It would appear very unnatural.
- In the same way, animating movements without a flicker of anticipation will also make your motion seem awkward, stale and lifeless.

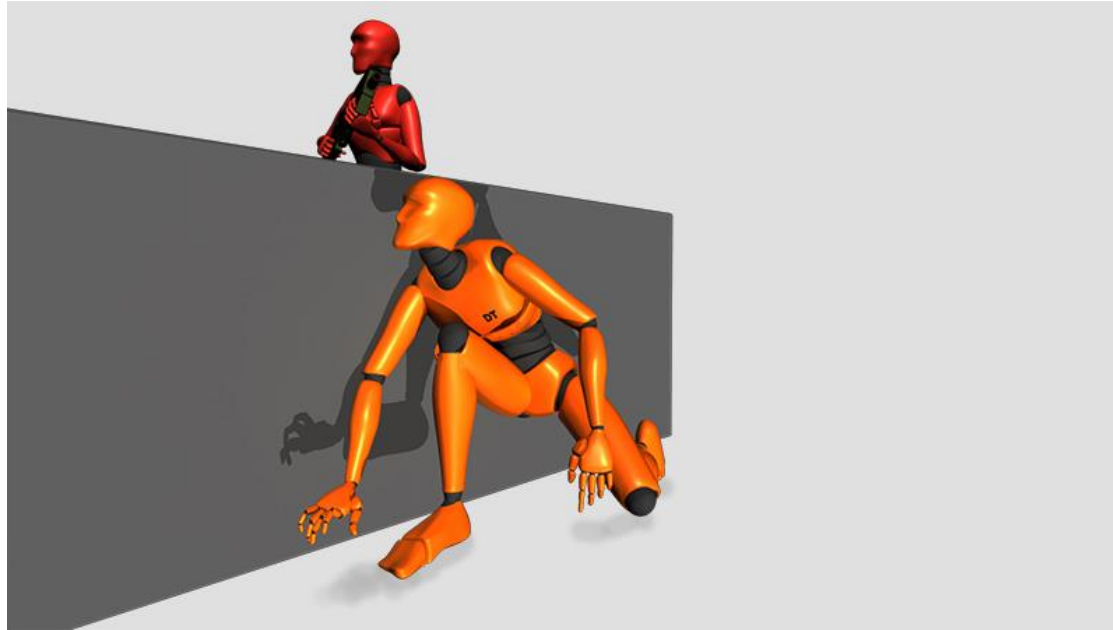






3. STAGING

- Staging is how you go about setting up your scene, from the placement of the characters, to the background and foreground elements, the character's mood, and how the camera angle is set up.
- The effective use of long, medium, or close up shots, as well as camera angles also helps in telling the story.
- There is a limited amount of time in a film, so each sequence, scene and frame of film must relate to the overall story.
- Do not confuse the audience with too many actions at once. Use one action clearly stated to get the idea across, unless you are animating a scene that is to depict clutter and confusion.



- Staging directs the audience's attention to the story or idea being told.
- Keep the focus on what's important within the scene, and keep the motion of everything else of non-importance to a minimum.
- Care must be taken in background design so it isn't obscuring the animation or competing with it due to excess detail behind the animation.
- Background and animation should work together as a pictorial unit in a scene.





4. STRAIGHT AHEAD AND POSE TO POSE ANIMATION

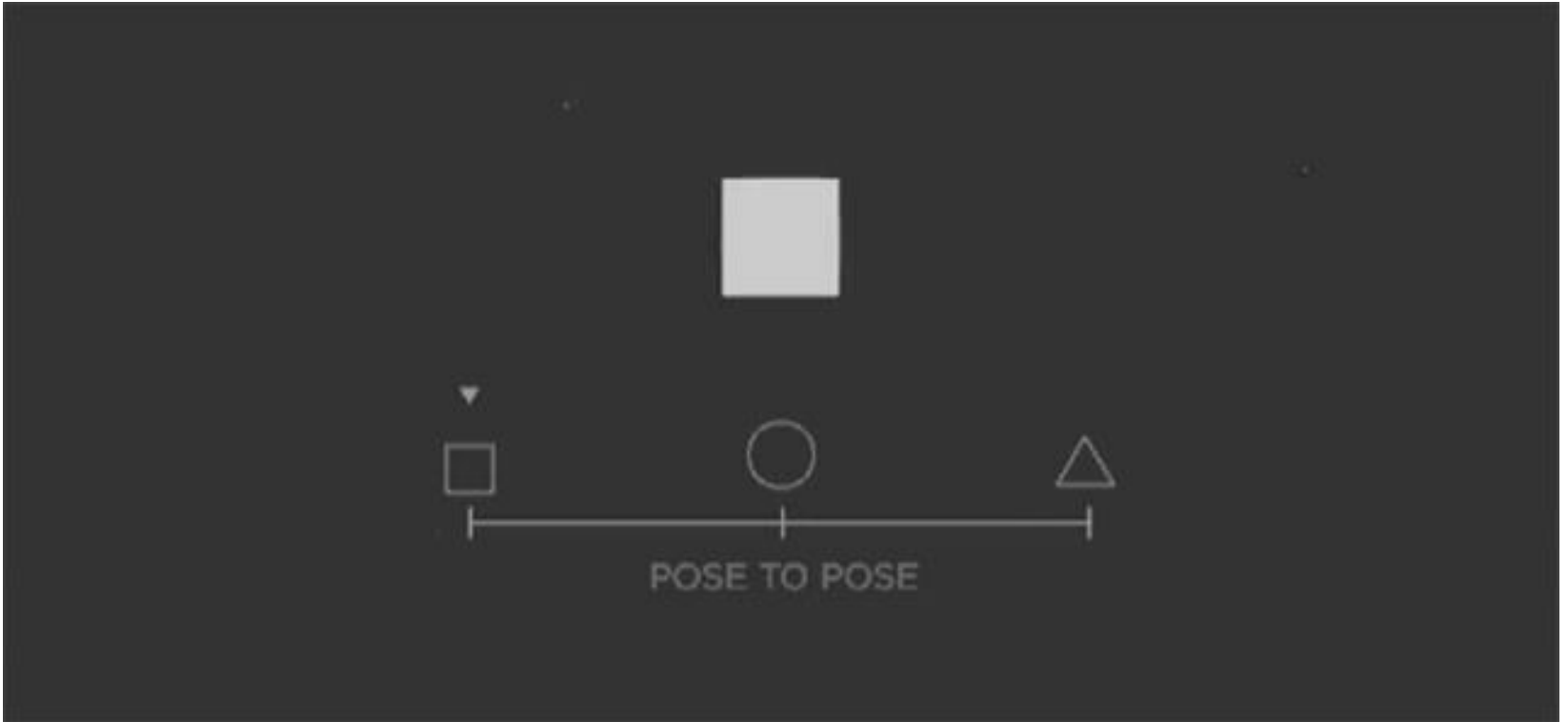
- There are two ways to handle drawing animation: straight ahead and pose to pose. Each has its own benefits, and the two approaches are often combined.
- Straight ahead action involves drawing frame-by-frame from start to finish. If you're looking for fluid, realistic movements, straight ahead action is your best bet.
- With the pose to pose technique, you draw the beginning frame, the end frame, and a few key frames in-between. Then you go back and complete the rest. This technique gives you a bit more control within the scene and allows you to increase the dramatic effect of the motion.



Straight Ahead



Pose to Pose





5. FOLLOW THROUGH AND OVERLAPPING ACTION

- When the main body of the character stops all other parts continue to catch up to the main mass of the character, such as arms, long hair, clothing, coat tails or a dress, floppy ears or a long tail (these follow the path of action).
- Nothing stops all at once. This is follow through.
- Overlapping action is when the character changes direction while his clothes or hair continues forward.
- The character is going in a new direction, to be followed, a number of frames later, by his clothes in the new direction. "DRAG," in animation, for example, would be when Goofy starts to run, but his head, ears, upper body, and clothes do not keep up with his legs.



- In features, this type of action is done more subtly. Example: When Snow White starts to dance, her dress does not begin to move with her immediately but catches up a few frames later.
- Long hair and animal tail will also be handled in the same manner. Timing becomes critical to the effectiveness of drag and the overlapping action.





6. EASE IN & EASE OUT OR SLOW-OUT AND SLOW-IN

- As any object moves or comes to a stop, there needs to be a time for acceleration and deceleration. Without ease in and ease out (or slow in and slow out), movements become very unnatural and robotic.
- The best way to understand slow in and slow out is to think about how a car starts up and stops. It will start moving slowly, before gaining momentum and speeding up. The reverse will happen when the car brakes.
- In animation, this effect is achieved by adding more frames at the beginning and end of an action sequence. Apply this principle to give your objects more life.

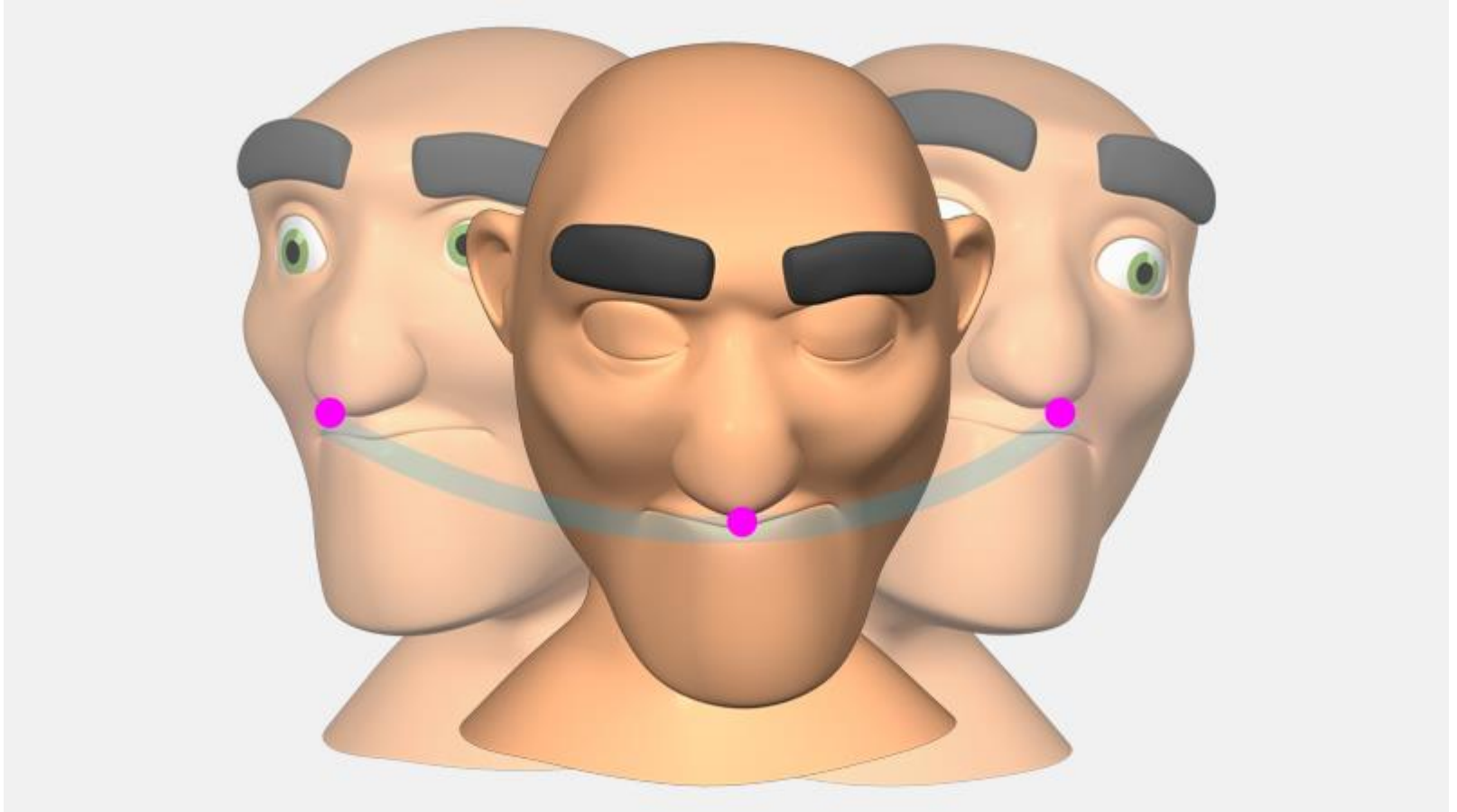






7. ARCS

- All actions, with few exceptions (such as the animation of a mechanical device), follow an arc or slightly circular path. This is especially true of the human figure and the action of animals.
- For example, when a character walks, even the tips of their toes should move in a rounded, arcing motion. When you toss a ball into the air, it follows a natural arc as the effects of the Earth's gravity act upon it.
- Think of natural movements in the terms of a pendulum swinging. All arm movement, head turns and even eye movements are executed on an arcs. Arcs give animation a more natural action and better flow.
- The only time something would move in a perfectly straight line is a robot.

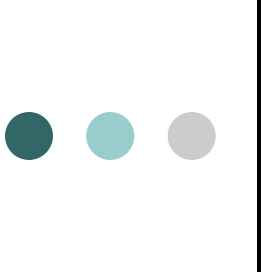






8. SECONDARY ACTION

- Secondary actions are used to support or emphasize the main action going on within a scene. Adding secondary actions help add more dimension to your characters and objects.
- Example: A character is angrily walking toward another character. The walk is forceful, aggressive, and forward leaning. The leg action is just short of a stomping walk. The secondary action is a few strong gestures of the arms working with the walk.
- Also, the possibility of dialogue being delivered at the same time with tilts and turns of the head to accentuate the walk and dialogue, but not so much as to distract from the walk action.

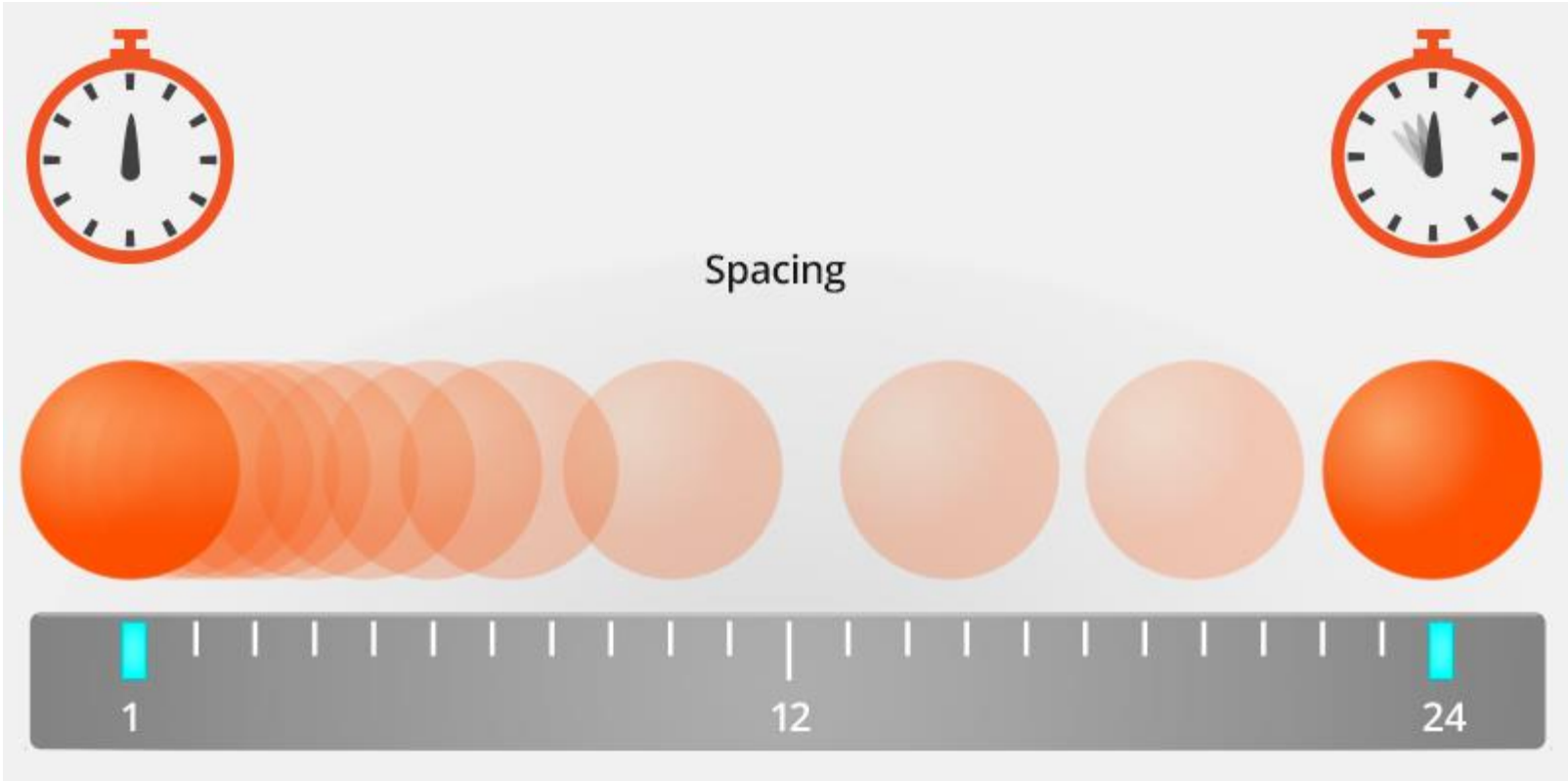
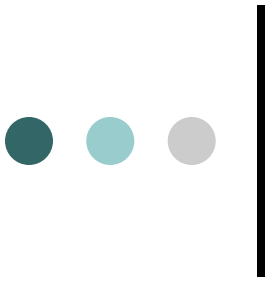
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- All of these actions should work together in support of one another.
 - Think of the walk as the primary action and arm swings, head bounce and all other actions of the body as secondary or supporting action.

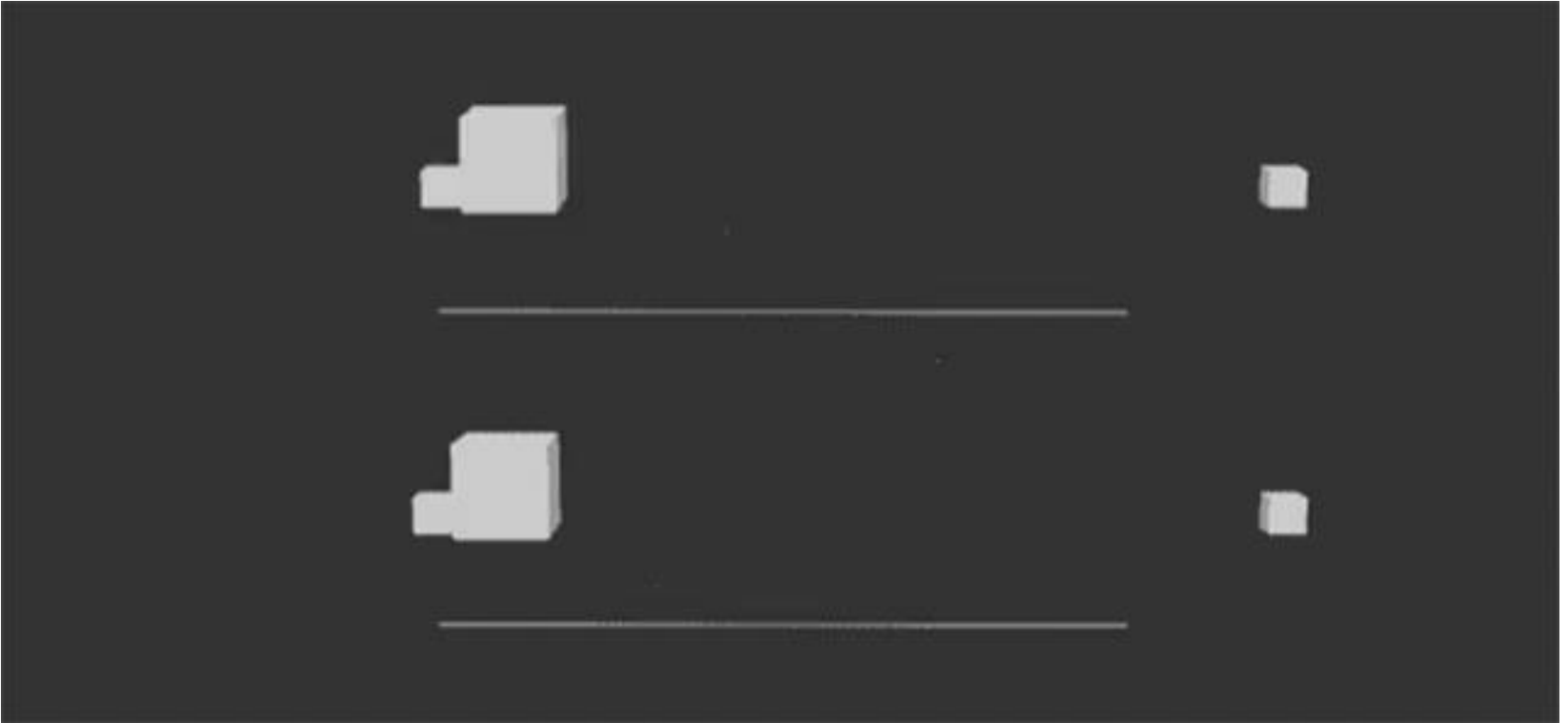




9. TIMING

- Timing refers to the number of frames between two poses, or the speed of action.
- For example, if a ball travels from screen left to screen right in 24 frames, that would be timing.
- It takes 24 frames or 1 second for the ball to reach the other side of the screen. Timing can also establish mood, emotion, and personality.
- Spacing refers to how those individual frames are placed.
- For instance, in the same example, the spacing would be how the ball is positioned in the other 23 frames.
- If the spacing is close together, the ball moves slower. If the spacing is further apart, the ball moves faster.

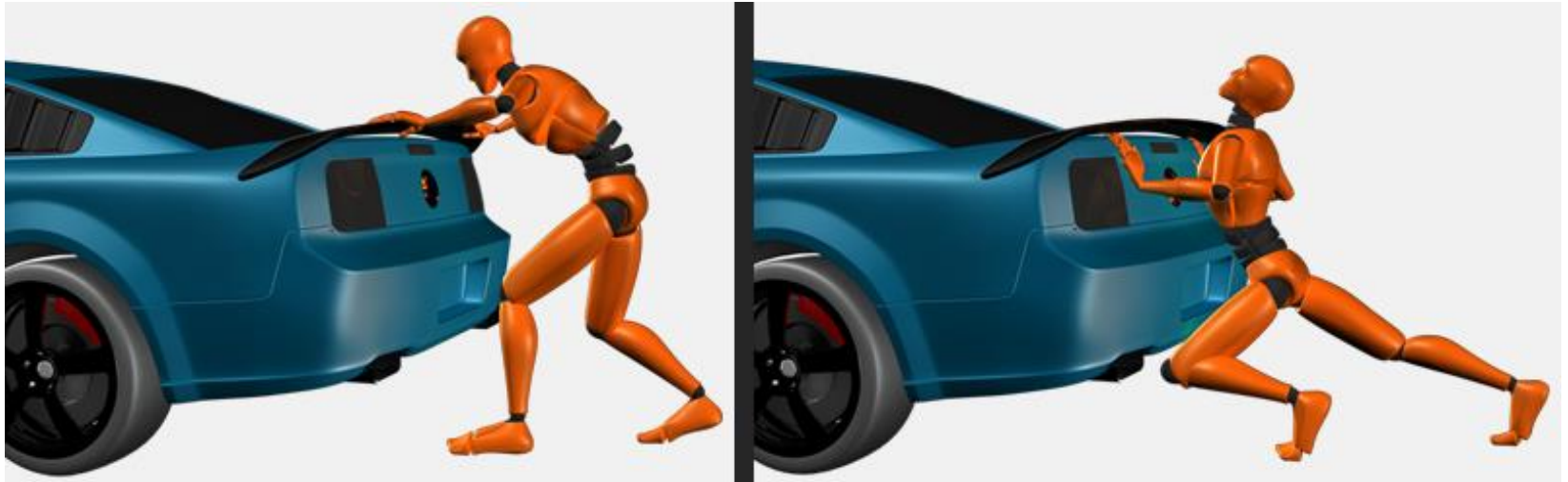


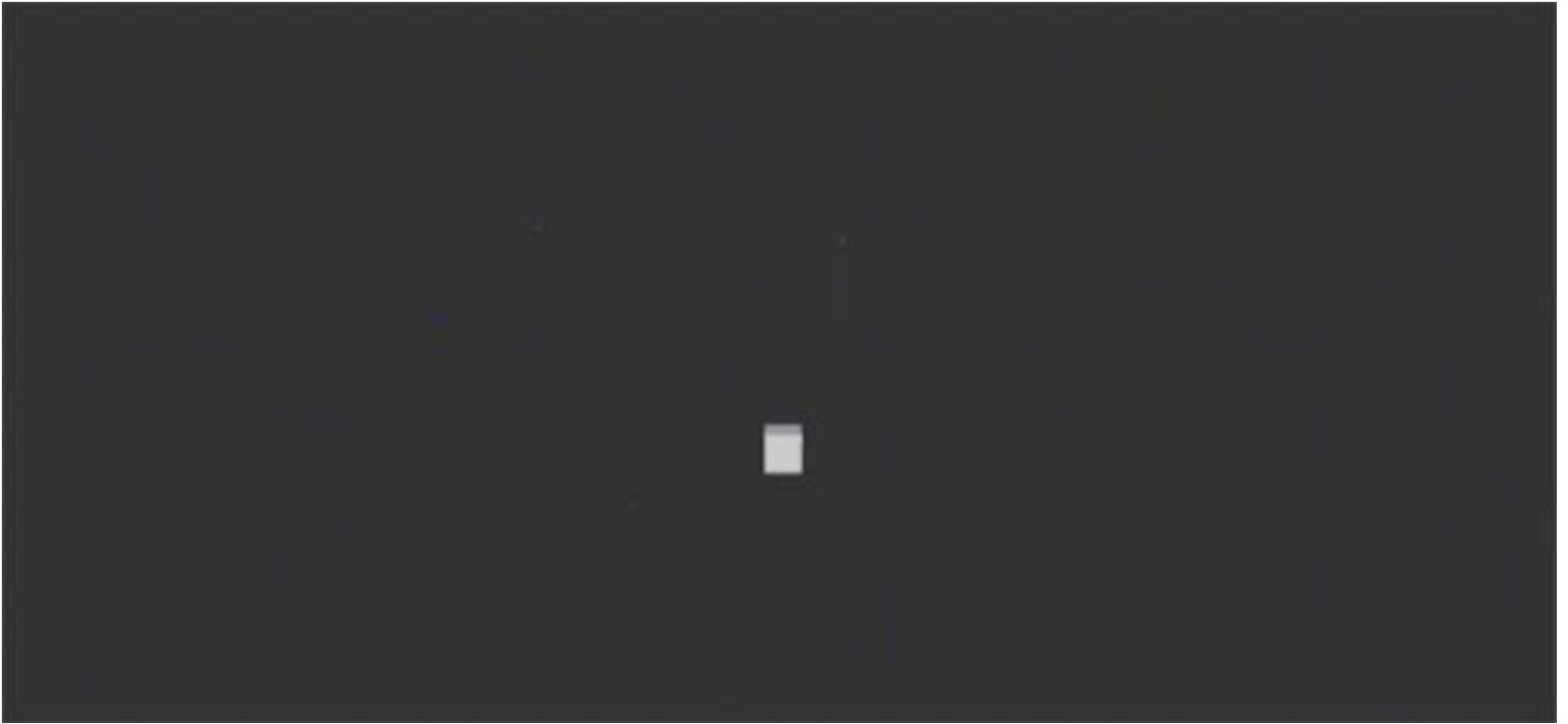




10. EXAGGERATION

- Exaggeration is not extreme distortion of a drawing or extremely broad, violent action all the time.
- Its like a caricature of facial features, expressions, poses, attitudes and actions.
- Too much realism can ruin an animation, making it appear static and boring. Instead, add some exaggeration to your characters and objects to make them more dynamic.
- Exaggeration can be used to create extremely cartoony movements including physical alterations or supernatural elements. Or, exaggeration can be incorporated with a little more restraint for more realistic actions.

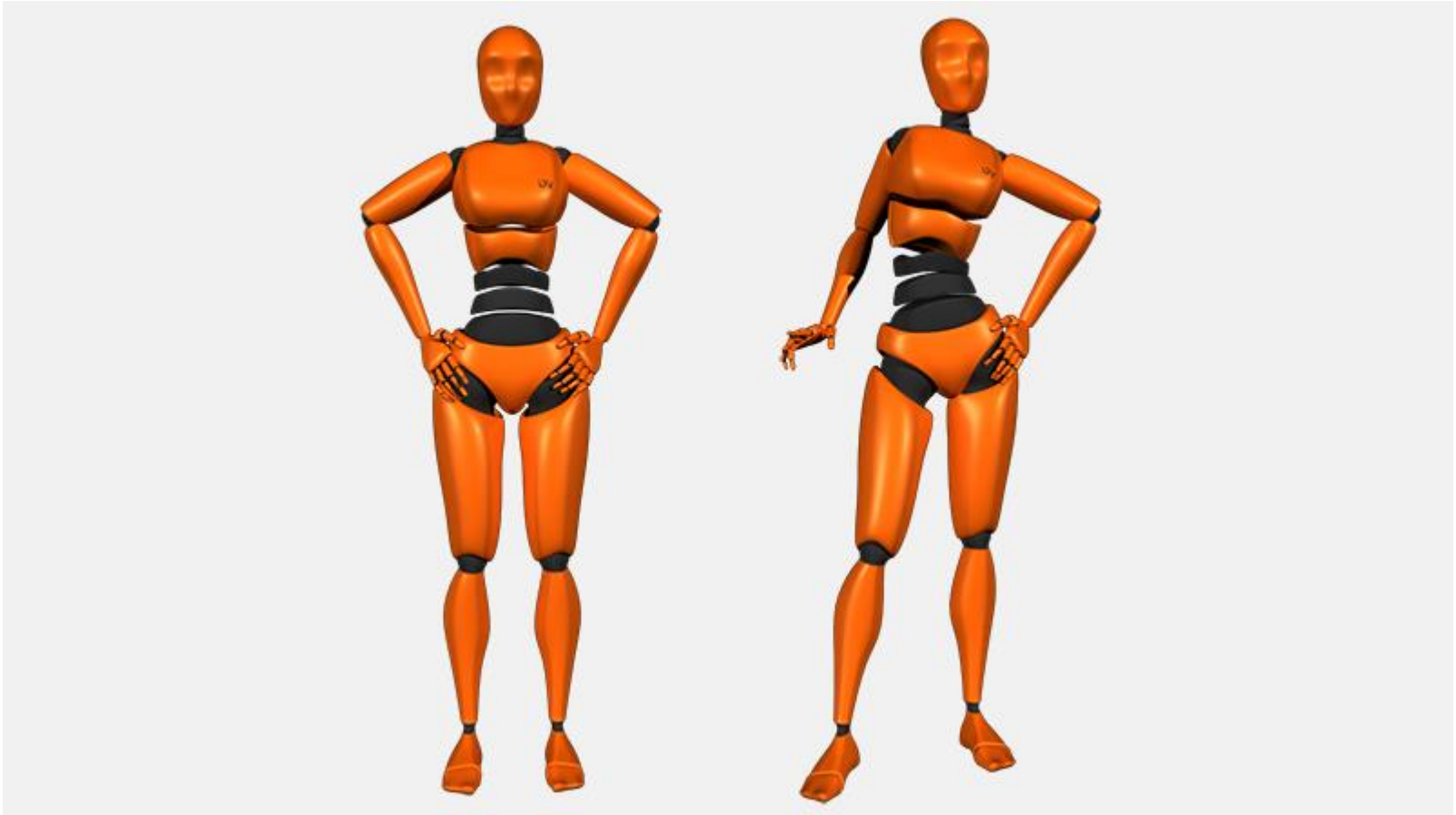


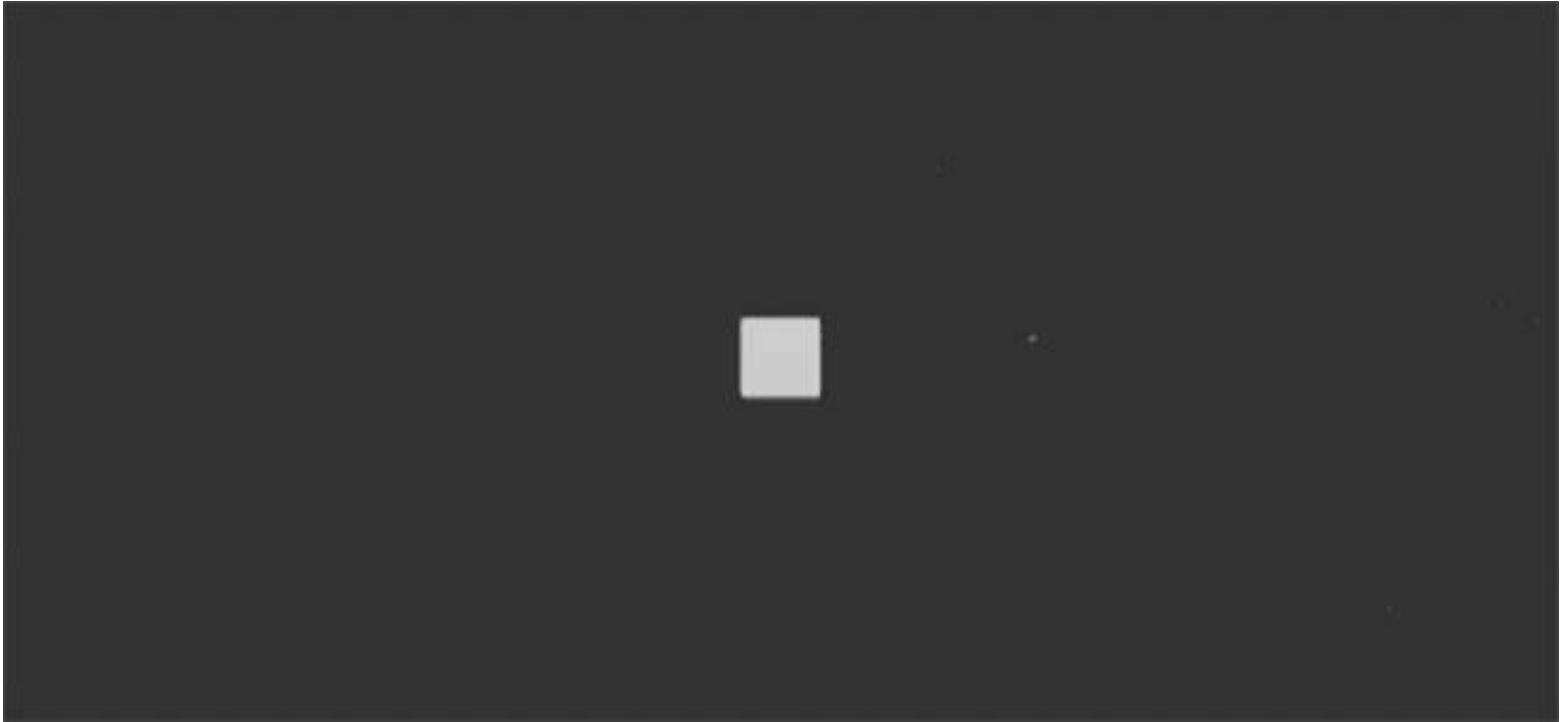




11. SOLID DRAWING

- In 2D animation, solid drawing is about creating an accurate drawing in terms of volume and weight, balance, shadow, and the anatomy in a pose.
- With 3D animation, animators need to think about how to pose out your 3D character rig to ensure there is correct balance and weight, as well as a clear silhouette.
- Avoid “twinning,” which is creating a mirrored pose across to the other side (both arms on hips or both hands in pockets) because this creates a rather boring and unappealing pose.



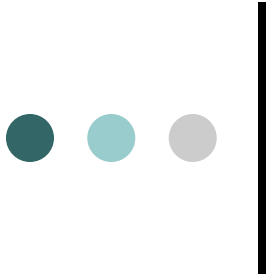




12. APPEAL

- A live performer has charisma. An animated character has appeal.
- Appealing animation does not mean just being cute and cuddly.
- All characters have to have appeal whether they are heroic, villainous, comic or cute.
- Appeal, as you will use it, includes an easy to read design, clear drawing, and personality development that will capture and involve the audience's interest.
- There is no formula for getting this right, but it starts with strong character development and being able to tell your story through the art of animation.
- Like all forms of story telling, the feature has to appeal to the mind as well as to the eye.





THANK YOU

