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Homework 4

a) In Unity, the world coordinate system is a global reference frame used to position, rotate, and scale objects within the scene. The origin (0, 0, 0) is the center of the world, and all objects are positioned relative to this fixed point. For example, placing an object at (5, 0, 0) means it is 5 units away from the world origin along the x-axis.

b) The local coordinate system is an object's own reference frame, which moves and rotates with the object. The object's position, rotation, and scale are measured relative to its local origin. For example, if you move an object forward along its local z-axis, it will move in the direction it is facing.

c) A Vector3 represents a point or direction in 3D space with three components (x, y, z). It is commonly used in Unity to represent positions, velocities, and directions. Vector3.up is a vector representing the world's upward direction (0,1,0), and is used to apply upward movement or positioning. Vector3.forward is a vector representing the forward direction in the world (0,0,1), and it is used to move an object in the forward direction of the world space.

d) The Rigidbody.AddRelativeForce function applies a force to an object's Rigidbody in the object's local space. This means that the force is relative to its current orientation. For example, applying force along the object's local forward direction will push the object forward regardless of how it is rotated in the scene.

e) The Input.GetKey function checks if a specific key on the keyboard is being pressed during the current frame. It returns true as long as the key is held down. For example, Input.GetKey(KeyCode.W) would return true while the "W" key is pressed, in this case used to move the rocket upward.