Female Body Model Instructions

Shape Key Values & Conditions

The shape key logic herein describes the changes for the new female modelers. The most significant changes to the modeler are: 1) there is only a single male and female modeler not differentiated by weight and 2) all `reconcile_ shape` keys have been removed.

Another improvement to this modeler is that size changes represent real-world measurements, which can be displayed `onChange` as the user grows the modeler.

Values marked by an asterisk (*) must be "reconciled". View `if conditions` below.

Stomach weight and arm muscle are newly introduced shape keys. Stomach Weight is grouped with `Torso` and Arm Muscle is grouped with `Arms`.

The base model should show `average` body features, which do not always have a value of null. For that reason, set the following shape keys to a value of 0.5 to represent an `Average` base shape.

Average Base Model Shape Key Values

Body Feature	Slider Value	Shape Key Value
Head Size	5	0.5
Shoulder Width/Stomach Size	5	0.5
Arm Extension	2	0.5
Torso Height	2	0.5
Leg Height	2	0.5

The following table describes the classification, values, and measurement values of each body feature. Use a `switch case` to store each measurement for the head, neck, stomach, and legs. These body features use two or more shape keys to determine their measurements. For example, a curvy stomach and a rectangle stomach with a stomach size slider value of 0.5 have different measurements *and* use the stomach shape, stomach weight, and stomach size to calculate their measurements. See separate table for complex measurements by size. The below table shows measurements for neck height, shoulder width, and crotch height.

Female Shape Key Values

Shape Key	Classification[1]	Sliders	Values	Measurement
Head Size*	Small Average Large Very Large	9	head_size = 0.0 – 0.25 head_size = 0.375 – 0.625 head_size = 0.75 – 0.875 head_size = 1.0	See table

Head Shape	Average (Oval) Oblong Round (Circle)	3	base shape[2] head_shape_oblong = 1.0 head_shape_round = 1.0	N/A
Neck Height	Tall Average Short Hidden None	5	0.0 0.25 0.5 0.75 1.0	6cm 4cm 2.5cm 1cm -1.5cm (0cm)
Neck Width*	Skinny Average Girthy	5	0.0 – 0.25 0. 5 – 0.75 1.0	See table
Neck Layers*	Average Has Neck Layers	2	base shape neck_layers = 1.0	N/A
Chin Shape*	Average Has Chin Fat	2	base shape chin_shape = 1.0	N/A
Trapezoid*	Average Trapezoid	2	trapezoid = 0.0 trapezoid = 1.0	N/A
Breasts	AAA -AA A B - C D - DD DDD/E F/G – H HH – HHH J – K I	9	breasts = 0.0 breasts = 0.125 breasts = 0.25 breasts = 0.375 breasts = 0.5 breasts = 0.625 breasts = 0.75 breasts = 0.875 breasts = 1.0	See table
Shoulder Height	Strong Average Dropped	3	shoulder_height = 0.0 shoulder_height = 0.5 shoulder_height = 1.0	N/A
Shoulder Width	Narrow Average Broad	9	shoulder_width + stomach_width_[shape] = 0.0 – 0.25 shoulder_width + stomach_width_[shape] = 0.375 – 0.75 shoulder_width + stomach_width_[shape] = 0.875 – 1.0	29cm - 31cm 32cm – 36cm 37cm – 40cm
Stomach Weight*[3]	N/A	9	stomach_weight = 0.0 stomach_weight = 0.125 stomach_weight = 0.25 stomach_weight = 0.375 stomach_weight = 0.5 stomach_weight = 0.625 stomach_weight = 0.75 stomach_weight = 0.875 stomach_weight = 1.0	See table
Stomach Shape	Average Curvy Spoon Muffintop Rectangle Round Pregnant	7	base shape stomach_shape_curvy = 1.0 stomach_shape_spoon = 1.0 stomach_shape_muffintop = 1.0 stomach_shape_rectangle = 1.0 stomach_shape_round = 1.0 stomach_shape_pregnant = 1.0	N/A
Arm Size*[4]	Arm size 1 Arm size 2	5	arm_size = 0.0 arm_size = 0.25	See table

	Arm size 3 Arm size 4 Arm size 5		arm_size = 0.5 arm_size = 0.75 arm_size = 1.0	
Arm Muscle	Toned Average Soft	3	arm_muscle = 0.0 arm_muscle = 0.5 arm_muscle = 1.0	N/A
Arm Extension	Short Average Long	3	arm_extension = 0.0 arm_extension = 0.5 arm_extension = 1.0	N/A
Torso Height	Average Elongated	2	torso_height = 0.0 torso_height = 1.0	N/A
Crotch Height	Average Tall	2	crotch_height = 0.0 crotch_height = 1.0	See table
Leg Height	Short Average Tall	3	leg_height = 0.0 leg_height = 0.5 leg_height = 1.0	N/A
Leg Size*	Leg size 1 Leg size 2 Leg size 3 Leg size 4 Leg size 5	5	arm_size = 0.0 – 0.125 arm_size = 0.0 – 0.125 arm_size = 0.0 – 0.125 arm_size = 0.0 – 0.125 arm_size = 0.0 – 1.0	See table
Hip Size	No Hips Some Hips Wide Hips	3	hip_size = 0.0 hip_size = 0.5 hip_size = 1.0	See table
Bottom Height[5]	Average Tall	2	bottom_height = 0.0 bottom_height = 1.0	N/A
Bottom Shape	Average Flat Round Square Heart Inverted Dunk	7	base shape bottom_shape_flat = 1.0 bottom_shape_round = 1.0 bottom_shape_square = 1.0 bottom_shape_heart = 1.0 bottom_shape_inverted = 1.0 bottom_shape_dunk = 1.0	N/A

[1]Classification describes the size and shape classification

[2]The base shape has a shape key value of null/0

[3]Stomach weight and arm muscles are new body features

[5]Changed name from Bottom Width to Bottom Height

Conditions to Reconcile Deformations

In the above table, the shape keys marked with an asterisk (*) require reconciliation to adjacent shape key values to prevent the modeler from having unrealistic shape deformations.

Reconcile Neck Width When Head Size Increments

Objective: to keep the modeler's head/neck proportions realistic as the head size increases, the modeler's neck width must increment as the head size grows.

Reconcile Logic

Target	Condition	Outcome
Head Size	If head_size >= 0.75	Min value neck_width == 0.375

Reconcile Trapezoid as Shoulder Width and Height Increments

Objective: to keep the modelers trapezoid shape consistent as the shoulder width and shoulder height increments, the trapezoid shape keys inherit lower values as the shoulder width and height change.

Reconcile Logic

Target	Condition	Outcome
Trapezoid	If shoulder_height == 0	Trapezoid == 0.5
	If shoulder_height == 0.5	Trapezoid == 0.25
	If shoulder_height == 1.0	Trapezoid == 0.0

Reconcile Stomach as Shoulder Width/Stomach Width Increments

Objective: the modeler we are using grows from a Skinny BMI to an Obese BMI. To avoid unrealistic deformations to the skinny/average models, the stomach_weight shape key requires a lesser value for smaller BMIs.

Reconcile Logic

Target	Condition	Outcome
Stomach Weight	If shoulder_width <= 0.375	Max stomach_weight == 0.375

Reconcile Arms Size as Shoulder Width/Stomach Width Increments

Objective: the arm size of the modeler should depict realistic sizes. When the modeler has a skinny/average size, the arm size cannot hold a value of 1, which represents the largest arm size. When the modeler has a obese size, the arm size cannot hold a value of 0, which would be unrealistically too small.

Reconcile Logic

Target	Condition	Outcome
Arm Size	If shoulder_width <= 0.125	Max arm_size == 0.375
	If shoulder_width === 0.25	Max arm_size == 0.5
	If shoulder_width === 0.375	Max arm_size == 0.625
	If shoulder_width == 0.5	Min arm_size == 0.125 && Max arm_size == 0.75
	If shoulder_width == 0.625	Min arm_size == 0.25 &&

		Max arm_size == 0.75
	If shoulder_width == 0.75	Min arm_size == 0.25
	If shoulder_width >= 0.875	Min arm_size == 0.375

Reconcile Leg Size as Shoulder Width/Stomach Width Increments

Objective: The conditions to reconcile the proportionality of the stomach size and leg size ensure that a body model with a low BMI does not have oversized legs.

Reconcile Logic

Target	Condition	Outcome
Leg Size	If shoulder_width <= 0.25	Max leg_size === 0.875
	If shoulder_width >= 0.5	Min leg_size === 0.125