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1. Gather materials for pouring impressions for study models:
   - tongue materials (alginate, Wonderfill or Play-doh)
   - plaster
   - cold water
   - measuring cups
   - large and small spatulas
   - debubbilizer spray
   - compressed air
   - Vacumixer and canister
   - vibrator
   - dog dishes or base formers
   - Sharpie pen to label wax bite

2. Remove impressions, wax bite, and lab slip from bag and organize work area.

3. Remove cotton rolls from inside impression.

4. Trim lingual extensions of mandibular impression and make a “tongue” in this lingual area being careful to keep debris out of the tooth impression areas.

5. Rinse each impression with cool water.

6. Spray a light coating of debubbilizer followed with a gentle stream of air to remove excess water but do not dry out the impressions.

7. Select the size of base former that will fit the impression. Hold the impression over the base former noting the best way to lay the impression on the base for midlines and tilt.

8. Measure out the correct amounts of plaster and cold water.

9. Pour the water into the canister then add the plaster.

10. Hand spatulate the water and plaster for 15 seconds.

11. Place the bladed lid on the canister producing an airtight seal.

12. Insert the vacuum tubing into the hole in the lid.

13. Insert the lid rotating mechanism into the rotating drive of the Vacumixer.

14. Turn on the Vacumixer and check the vacuum gauge to be at 22 pounds of pressure or more.

15. Mix the plaster for 30 to 45 seconds.

16. With the canister still under the vacuum, remove the canister from the rotating mechanism, and place it on a vibrator on high-speed vibration.

17. Slowly rotate the blades inside the canister to release any air bubbles within the plaster mix.

18. Turn off the Vacumixer and remove the vacuum tube from the lid.

19. Slowly lift the lid from the canister while holding it on the vibrator so that the plaster mix on the blades flows into the canister.
20. Place the lid with the blades in a sink under running water and rinse the plaster from the blades as soon as possible before it hardens.

21. Scoop up a small amount of plaster onto a small spatula.

22. Gently holding the impression against the vibrator, let some mixed plaster “run” into the most terminal molar and forward watching that the plaster runs into every tooth depression.

23. Add more plaster at the terminal molar and watch it run into the anterior teeth slowly, one tooth at a time. If there is excess moisture, the plaster will push it forward and out of the impression at the other terminal molar. This will prevent air and water voids in the model.

24. Speed up the runny process by pressing the impression against the vibrator and slow down the plaster by lifting the impression off the vibrator.

25. Slightly rotate the impression to encourage the plaster to go into each area as the plaster runs around the arch and out at the other terminal molar.

26. If there is uncertainty about an air bubble being trapped, gently blow the area with a stream of air to dislodge the bubble, then slowly run plaster into the area again.

27. After all tooth surfaces have been “coated”, scoop more plaster onto a larger spatula and fill the impression to the rolled borders across the tongue or palate, being careful to not trap any air bubbles.

28. Fill the base former with a steady stream of plaster flowing out of the canister being careful to not trap any pockets of air.

29. Slightly overfill the base former so plaster flows over the front edge. This “lip” will be used in trimming later.

30. Vibrate the filled base former for 30 to 45 seconds releasing any small bubbles of air.

31. Place the full base former on a stable counter top.

32. Carefully place the poured impression onto the plaster of the base former. Pay attention to the midline of the impression and the horizontal tilt.

33. Gently press the impression slightly, into the plaster of the base former and slightly “mold” the edges together with a spatula being careful to not trap air bubbles or to push the impression down into base too far. Check for a slight lip over the front of the base former.

34. Let it set and harden for 1 to 2 hours but separate the impression before it dries out. If the impression does dry out, soak the poured model and the impression in water for 10 minutes before removing the impression from the model so the teeth will not break.

35. Separate the impression from the plaster model being careful to not twist the impression so much that teeth are broken. Remove the base former.

36. Remove the impression material from the tray and put it in the hazardous waste container.

37. Place the impression tray in solvent to remove all debris.

38. Properly sterilize the impression tray, clean the base former and return both to storage area.

39. Clean and disinfect the work area.

40. Store the untrimmed models, wax bite and lab slip in the proper area for trimming later.
1. Soak untrimmed models in water for 20 minutes.
2. Mark the palatal midline of the maxillary model with a sharp pencil.
3. Make another pencil line perpendicular to the midpalatal line and as far distal as possible to the terminal molars on each side.
4. Place the occlusal surfaces of the model teeth on the trimmer table and measure the 35 millimeters height for the model from the incisal edges and mark with a pencil line on the base in three areas.
5. Looking down on the occlusal surfaces, measure 4 millimeters out from the buccal surfaces of the teeth to indicate the depth of the buccal surfaces of the model base, mark with a pencil.
6. Trim the distal corners of the maxillary base slightly to reduce the size of the base.
7. Place the occlusal guide into the slot on the trimmer table.
8. While holding the occlusal surfaces of the maxillary teeth against the occlusal guide using the “lip” edges of the model, trim the “top” of the model base so it is parallel with the occlusal surfaces of the teeth and to the 35 millimeter pencil lines.
9. Trim the top of the model so that the whole top is parallel with the occlusal surfaces and so the base thickness is 13 millimeters from the depth of the vestibule to the top of the model. The total model height should be about 35 millimeters from the top of the model to the occlusal surfaces.
10. Remove the occlusal guide from the trimmer.
11. Trim the distal surface of the model base that was marked previously with a pencil so it is perpendicular to the midpalatal line. This surface will be trimmed more later.
12. Place the angle guide in the trimmer.
13. Trim the right buccal surface so it is 70° from the model distal surface and about 4 millimeters away from the teeth.
14. Trim the left buccal surface so it is 70° from the model distal surface and about 4 millimeters away from the teeth.
15. Trim the right front surface so it is 30° from the model distal surface and comes to a point where the center facial midline would be.
16. Trim the left front surface so it is 30° from the model distal surface and comes to a point where the center facial midline would be.
17. Trim the right distobuccal corner at 120° from the model distal surface so it is 13 millimeters in width.
18. Trim the left distobuccal corner at 120° from the model distal surface so it is 13 millimeters in width.
19. Pick off any big bubbles from the teeth that might interfere with the occlusion.
20. Trim any excess from the base of the lower model.
21. Insert the occlusal guide into the trimmer.
22. Occlude the models together using the wax bite. Double check overjet with the notes on
the lab slip.
23. Measure 70 millimeters for the total height of the occluded models and make three pencil
marks on the base of the mandibular model at this height.
24. Holding the models in occlusion using the “lip” on lower model, hold the top of the upper
model against the occlusal guide and trim the bottom of the lower model so it is parallel
with the top of the upper model when they are in occlusion.
25. Trim the mandibular model base until it is one flat surface, until the thickness of the
mandibular model base is 13 millimeters from the vestibule to the bottom surface; the
overall height of the mandibular model is 35 millimeters in the front; and the height of both
models occluded together is 70 millimeters.
26. Remove the occlusal guide.
27. Trim the distal surface of the mandibular model while the models are in occlusion and
resting on the bottom surface of the mandibular model.
28. Use the distal surface of the maxillary model as the guide of how far to trim in toward the
mandibular molars. Trim until both the maxillary and mandibular distal surfaces are being
trimmed at the same time.
29. Insert the angle guide into the trimmer.
30. Measure 4 millimeters out from the facial surfaces of the teeth of the mandibular model.
31. Trim the right buccal surface so it is 65° to the distal surface of the mandibular model and
4 millimeters from the facial tooth surfaces.
32. Trim the left buccal surface so it is 65° to the distal surface of the mandibular model and 4
millimeters from the facial tooth surfaces.
33. Trim the front of the model base rounding the curve from cuspid to cuspid keeping the
surface 4 millimeters from the facial surfaces of the teeth.
34. Trim the right distobuccal surface at 120° to the distal surface so it is 13 millimeters wide.
35. Trim the left distobuccal surface at 120° to the distal surface so it is 13 millimeters wide.
36. Scrub the models with a toothbrush.
37. Rinse the trimmer before the plaster dries.
38. Using a sharp lab knife trim all sharp edges but maintain the natural anatomy.
39. Pick bubbles and fill in minor voids.
40. Smooth all edges with fine sand paper.
41. Smooth the trimmed flat surfaces with a finishing stone.
42. Rinse and scrub both models with a toothbrush.
43. Dry for 24 hours.
44. Label.
45. Soak in soap solution.
46. Polish with a soft cloth.
**SM-03: Study Models Criteria Checklist**

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<table>
<thead>
<tr>
<th>MAXILLARY MODEL</th>
<th>Great</th>
<th>Good</th>
<th>Redo</th>
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<tbody>
<tr>
<td>1. Top surface parallel to occlusal plane.</td>
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<tr>
<td>2. Distal surface perpendicular horizontally to midpalatal line.</td>
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<tr>
<td>3. Distal surface perpendicular to top surface.</td>
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<tr>
<td>4. Buccal surfaces at $70^\circ$ angle to distal surface.</td>
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<tr>
<td>5. Buccal surfaces 4 millimeters from facial surfaces of teeth.</td>
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<tr>
<td>6. Distobuccal surfaces at $120^\circ$ angle to distal surface.</td>
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<tr>
<td>7. Distobuccal surfaces 13 millimeters wide.</td>
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<tr>
<td>8. Facial surfaces at $30^\circ$ angle to distal surface.</td>
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<tr>
<td>10. Facial surfaces come to point at what would be the patient’s facial midline.</td>
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<tr>
<td>11. Height of facial surface base is 13 millimeters.</td>
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<tr>
<td>12. Height of maxillary model is 35 millimeters.</td>
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<th>MANDIBULAR MODEL</th>
<th>Great</th>
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<th>Redo</th>
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<tbody>
<tr>
<td>1. Bottom surface parallel with top surface of maxillary model.</td>
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<tr>
<td>2. Distal surface parallel and even with distal surface of maxillary model.</td>
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<td></td>
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<tr>
<td>3. Distal surface perpendicular to bottom surface.</td>
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<tr>
<td>4. Buccal surfaces at $65^\circ$ angle to distal surface.</td>
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<tr>
<td>5. Buccal surfaces 4 millimeters from facial surfaces of teeth.</td>
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<tr>
<td>6. Distobuccal surfaces at $120^\circ$ angle to distal surface.</td>
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<tr>
<td>7. Distobuccal surface 13 millimeters wide.</td>
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<tr>
<td>8. Facial surface curved from cuspid to cuspid.</td>
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<tr>
<td>10. Facial surface height of base is 13 millimeters.</td>
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<th>OCCLUDED MODELS</th>
<th>Great</th>
<th>Good</th>
<th>Redo</th>
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<tr>
<td>1. Occlusion is the same as maximum intercuspation or centric occlusion of the patient.</td>
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<td>2. Detailed anatomy present and accurate.</td>
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<td>3. Terminal molars present.</td>
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<tr>
<td>4. Occluded models 70 millimeters in height.</td>
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<td>5. Models properly labeled.</td>
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