

THE DRAWING PATH

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# Comparative Measuring

A Complete Lesson Plan

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BEGINNER

HOBBYIST

PROFESSIONAL

Lesson 3 · Proportions

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*Teach Yourself to See*

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SKILL LEVEL 1

# BEGINNER

Seeing relationships, not sizes.

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1

# Comparative Measuring — Beginner

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## What Is Comparative Measuring?

Comparative measuring is the technique of determining how parts of a subject relate to each other in size — not in absolute measurements like centimetres, but in ratios. If a face is 5 head-widths tall and 3.5 head-widths wide, those ratios are comparative measurements. If a building is twice the height of the figure standing next to it, that ratio is a comparative measurement. The key insight: you are not measuring the thing, you are measuring the relationship between parts of the thing.

Comparative measuring liberates you from rulers and scales. A portrait drawn from a 5cm photo and enlarged to fill an A2 page uses exactly the same ratios — only the absolute size changes. This is why comparative measuring is the foundation skill of representational drawing: it works at any scale.

### [ VISUAL EXAMPLE ]

*A figure with a horizontal line marking eye-level. The figure's height divided into 7.5 equal "head heights." Each head height labeled. The same unit marks the width at shoulders (2 heads), hips (1.5 heads).*

## The Pencil Method

The pencil method is the most common manual comparative measuring tool. Hold your pencil at arm's length, fully extended, with your arm locked straight. Close one eye. Align the pencil's tip with the top of the measurement unit, then slide your thumb to align with the bottom. You now have a measurement unit on the pencil. Without moving your thumb, compare this unit to other parts of the subject. How many units tall is the figure? How many units is the width? Record these ratios in your drawing.

## Common Mistakes

### Arm not fully extended

Bending the elbow changes the apparent size of the measurement unit. Lock the arm straight every time.

### Moving thumb before comparing

Releasing the thumb position between measurements loses the unit. Keep the thumb locked until all comparisons using that unit are complete.

### Measuring absolute size rather than ratio

Recording "the arm is 4 inches" instead of "the arm is 1.2 head units." Absolute measurements are useless at a different scale.

## Not checking measurements against each other

Measuring width and height separately without checking their ratio against each other.  $\text{Width} \div \text{height} = \text{aspect ratio}$ , which should match the subject.

# Beginner Exercises

## Head Unit Figure

25 min

**TRAINS:** Dividing the figure into head-height units

### STEPS

1. Using a mirror or a photo, measure the figure in head heights.
2. The standard human is 7.5 heads tall. Measure: shoulder width (usually ~2 heads), hip width (~1.5 heads), arm length to wrist (~3 heads).
3. Draw the figure using only these ratios — no reference visible while drawing.
4. Compare your drawing back to the reference: where did your ratios deviate?

### SELF-EVALUATE:

*Are your key ratios (height, shoulder width, hip width) within 10% of the reference? Which ratio was hardest to measure accurately?*

## Object Ratio Grid

20 min

**TRAINS:** Comparative measuring of a still life

### STEPS

1. Set up 3 objects of very different sizes: a mug, a bottle, and a small box.
2. Using the mug as the unit, measure: how tall is the bottle relative to the mug? How wide is the box relative to the mug?
3. Draw the three objects using only ratios — do not measure the paper, only the relationships.
4. Check: do the drawn objects have the same size relationships as the setup?

### SELF-EVALUATE:

*Do the three drawn objects have the same proportional relationships as in your setup? Which was hardest to measure?*

## Plumb Line Check

30 min

**TRAINS:** Vertical alignment as a proportional tool

### STEPS

1. Draw a still life or figure.
2. After drawing, use a plumb line (or the vertical edge of your pencil) to check: what appears directly above/below what in the reference?
3. Mark any misalignments in your drawing.
4. Correct the most severe misalignment. Did correcting it improve the overall drawing?

### SELF-EVALUATE:

*Were there misalignments you hadn't noticed without the plumb line check? Did correcting them improve the overall likeness?*

## Copy with Proportional Grid

35 min

**TRAINS:** Transferring ratios via a grid

### STEPS

1. Draw a 4x4 grid on a reference image (or print one). Draw a proportionally identical but larger 4x4 grid on your paper.
2. Copy the reference into the larger grid, square by square.
3. The grid forces you to focus on the content of each cell rather than the whole image.
4. After completing, compare the proportions to the original.

### SELF-EVALUATE:

*Are the proportions in your copy accurate? Did the grid help you avoid distortions you would have made freehand?*

## Beginner Resources

### Proko — Proportions of the Human Figure

[youtube.com/user/ProkoTV](https://youtube.com/user/ProkoTV)

Proko's dedicated proportions series uses the head-unit system clearly. Applied to the figure but the principle is universal.

## **Drawing on the Right Side of the Brain — B. Edwards**

[amazon.com/search?q=drawing+on+right+side+brain](https://amazon.com/search?q=drawing+on+right+side+brain)

Betty Edwards' classic teaches the pencil sighting method in detail. Foundational for beginners.

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## **Ctrl+Paint — Measuring and Sight-Sizing**

[ctrlpaint.com](https://ctrlpaint.com)

Free digital painting library. The measuring segment is directly applicable to proportional accuracy.

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SKILL LEVEL 2

# HOBBYIST

Angles, complex subjects, and translation to paper.

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2

# Comparative Measuring — Hobbyist

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## Measuring Angles

Angles are just as important to measure as lengths. The angle of a shoulder slope, the tilt of a building face, the line of a nose bridge — these are all angles that must be correctly observed to produce a proportionally accurate drawing. The pencil method works for angles too: hold the pencil parallel to the edge you are measuring, then transfer that angle to your drawing without letting the pencil rotate. The most common error is mentally "correcting" angles to what you expect them to be rather than what they actually are.

## Comparative Measuring in Complex Subjects

Complex subjects (the human figure, architectural scenes, animals) have many measurements that need to be related to each other. The systematic approach: (1) establish one reliable unit (usually the head for figures, a key dimension for architecture), (2) compare all major dimensions to this unit, (3) check the ratios against each other for internal consistency. Never measure in isolation — every measurement should be cross-referenced with at least two others.

## Common Mistakes

### Measuring without a consistent unit

Taking measurements using different units for different parts of the subject. Choose one unit and use it for all comparisons.

### Correcting angles to expectation

A shoulder that actually slopes steeply drawn with a gentle slope because "shoulders should be horizontal." Observe, don't assume.

### Not checking aspect ratio first

Drawing a head too wide or tall before any internal proportions are placed. Check the overall width-to-height ratio before any internal structure.

## Hobbyist Exercises

## Angle Measurement Study

40 min

**TRAINS:** Transferring observed angles accurately

### STEPS

1. Choose a subject with several distinct diagonal angles: a building, a figure in motion, a still life of reclining objects.
2. Identify 8 significant angles in the subject.
3. For each angle, measure with the pencil method, then transfer to your drawing.
4. Compare the transferred angles against the reference: how many are within  $5^\circ$  of accurate?

### SELF-EVALUATE:

*Which angles were most difficult to transfer accurately? Is there a systematic direction error (always tilting the wrong way)?*

## Full Figure Measurement Session

45 min

**TRAINS:** Systematic proportional figure drawing

### STEPS

1. Draw a standing figure from a reference photo.
2. Before making any marks, measure: total height in head units, shoulder width in head units, hip width in head units, leg length in head units.
3. Mark these measurements lightly on your drawing as a framework.
4. Build the figure from these anchors.
5. Check measurements at the end — has the final drawing maintained the initial ratios?

### SELF-EVALUATE:

*Did the measurement framework prevent the proportional errors you would normally make? Which measurement anchors were most useful?*

## Architectural Proportions Study

45 min

**TRAINS:** Comparative measuring in a complex scene

### STEPS

1. Choose an architectural photograph: a building facade or interior.
2. Identify the primary unit (e.g., the width of one window bay).
3. Measure: how many units wide is the whole facade? How many units tall? How tall is each floor in units?
4. Draw the facade using only these ratios, starting from the primary unit.
5. Do not look at the overall image while drawing — refer only to your measurements.

### SELF-EVALUATE:

*Does the drawn facade match the proportions of the photograph? Which elements were hardest to measure accurately using your chosen unit?*

## Negative Space Proportional Check

35 min

**TRAINS:** Using gaps as measuring tools

### STEPS

1. Choose a complex subject (a chair, a figure, a tree) in front of a plain background.
2. Instead of measuring the subject, measure the negative spaces around it: the gap between the arm and the body, the space under the chair seat.
3. Draw the negative spaces first — the subject will appear as what remains.
4. Compare to direct measurement: which method produced more accurate proportions?

### SELF-EVALUATE:

*Was the negative space method more or less accurate than direct measurement? Why might measuring negative space sometimes produce better results?*

## Hobbyist Resources

### Juliette Aristides — Classical Drawing Atelier

[amazon.com/search?q=classical+drawing+atelier+aristides](https://amazon.com/search?q=classical+drawing+atelier+aristides)

Professional atelier-method book with strong sight-measuring methodology for complex subjects.

### Watts Atelier — Proportions Curriculum

[wattsatelier.com](https://wattsatelier.com)

Paid online atelier program with professional proportional figure drawing instruction.

## **New Masters Academy — Proportions**

[newmastersacademy.com](http://newmastersacademy.com)

Paid video library with professional instruction on comparative measuring for the figure and portrait.

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SKILL LEVEL 3

# PROFESSIONAL

Sighting at speed and calibrating intuition.

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3

# Comparative Measuring — Professional

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## Sighting at Speed

The goal of all measuring practice is to eventually internalise the measurements — to sight accurately without the pencil method, using only trained visual judgment. Professionals working from life in quick gesture sessions (30 seconds, 1 minute) cannot stop to measure each proportion. Their speed comes from years of calibrated practice: they have measured the same human proportions so many times that the ratios are automatic. Speed measuring is a skill built through deliberate slow measuring practice — not by rushing the measuring stage.

## Measuring as Verification, Not Construction

At the professional level, measuring transitions from a construction tool to a verification tool. The drawing is made from intuition and trained perception; measuring is applied at key checkpoints to catch systematic errors before they propagate. This preserves the spontaneity of the mark while maintaining proportional accuracy. The discipline is knowing when to check — usually after the major masses are placed and before adding any detail.

## Common Mistakes

### Relying on measuring when intuition should be trained

Using mechanical measuring for every mark instead of building visual intuition. Measuring should supplement, not replace, trained judgment.

### Checking too late

Discovering a major proportion error after hours of detail work. Check major masses early, before investing in refinement.

### Over-measuring to avoid commitment

Using measuring as a procrastination tool — measuring everything precisely but never making decisive marks. Build confidence in your marks.

## Professional Exercises

## Timed Proportional Accuracy Study

45 min

**TRAINS:** Speed measurement training

### STEPS

1. Draw the same subject 5 times at increasing speeds: 20 min, 10 min, 5 min, 2 min, 1 min.
2. For each drawing, focus on proportion accuracy over expressiveness.
3. After all 5, measure the accuracy of each using the pencil method.
4. Chart: does your accuracy decline at speed? At which time limit does accuracy drop significantly?

### SELF-EVALUATE:

*Can you maintain proportional accuracy at 5 minutes? At 2? Where does your visual intuition diverge from measured accuracy?*

## Sight-Sizing Portrait Study

120 min

**TRAINS:** Academic proportional accuracy

### STEPS

1. Using sight-sizing (where the drawing is same-size as what your eye sees from your position), make a portrait study.
2. Measure with both the pencil method and plumb line at every stage.
3. The goal is a measurably accurate proportional likeness.
4. Document your measuring process: what did you check? When? What errors did the measurements catch?

### SELF-EVALUATE:

*Is the finished portrait proportionally accurate? Which measuring checks were most useful in preventing compounding errors?*

## Proportion Error Diary

(ongoing)

**TRAINS:** Identifying and correcting systematic biases

### STEPS

1. Draw 10 subjects from life or reference over the course of a week.
2. After each drawing, measure your key proportions against the reference.
3. Record the direction and magnitude of errors: do you consistently make the head too wide? Arms too short?
4. Design a targeted warm-up routine to address your top 3 systematic errors.

### SELF-EVALUATE:

*What are your 3 most consistent systematic proportion errors? Does a targeted warm-up reduce their frequency?*

## Imaginative Figure — Proportional Design

90 min

**TRAINS:** Applying measurement knowledge to invention

### STEPS

1. Design an original character whose proportions intentionally deviate from the 7.5-head standard.
2. Establish: total height in head units, limb ratios, shoulder-to-hip ratio.
3. Draw the character in 3 poses — all proportional relationships must be consistent across poses.
4. Document the character's proportion specifications as a reference sheet.

### SELF-EVALUATE:

*Are the character's proportions consistent across all three poses? Does the proportion deviation communicate the intended character qualities?*

## Professional Resources

### Bargue Drawing Course

[amazon.com/search?q=bargue+drawing+course](https://amazon.com/search?q=bargue+drawing+course)

The classic academic sight-measuring drawing course. Used in ateliers worldwide. High-quality plates for proportional study.

### Juliette Aristides — Lessons in Classical Drawing

[amazon.com/search?q=aristides+lessons+classical](https://amazon.com/search?q=aristides+lessons+classical)

Advanced atelier-method book. The measuring and proportion chapters are the professional standard.

## Angel Gagne — Sight Sizing

[youtube.com/search?q=angel+gagne+sight+sizing](https://www.youtube.com/search?q=angel+gagne+sight+sizing)

Clear professional demonstration of sight-sizing technique for portrait and figure.

# Master Exercise Index

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*All exercises consolidated for quick reference.*

## Beginner

| #  | Exercise Name          | What It Trains                   | Duration |
|----|------------------------|----------------------------------|----------|
| B1 | Head Unit Figure       | Figure in head-height units      | 25 min   |
| B2 | Object Ratio Grid      | Still life comparative measuring | 20 min   |
| B3 | Plumb Line Check       | Vertical alignment tool          | 30 min   |
| B4 | Proportional Grid Copy | Grid transfer method             | 35 min   |

## Hobbyist

| #  | Exercise Name             | What It Trains                 | Duration |
|----|---------------------------|--------------------------------|----------|
| H1 | Angle Measurement Study   | Transferring observed angles   | 40 min   |
| H2 | Full Figure Measurement   | Systematic proportional figure | 45 min   |
| H3 | Architectural Proportions | Complex scene measuring        | 45 min   |
| H4 | Negative Space Check      | Gaps as measuring tools        | 35 min   |

## Professional

| #  | Exercise Name               | What It Trains                    | Duration |
|----|-----------------------------|-----------------------------------|----------|
| P1 | Timed Proportional Accuracy | Speed measurement training        | 45 min   |
| P2 | Sight-Sizing Portrait       | Academic proportional accuracy    | 120 min  |
| P3 | Proportion Error Diary      | Systematic bias identification    | ongoing  |
| P4 | Imaginative Figure Design   | Proportion knowledge in invention | 90 min   |



# Resource Directory

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All recommended resources, consolidated.

## Beginner

| Resource              | URL   | Notes                   |
|-----------------------|---|-------------------------|
| Proko Proportions     | <a href="https://youtube.com/user/ProkoTV">youtube.com/user/ProkoTV</a> | Head-unit system video  |
| Drawing on Right Side | <a href="https://amazon.com">amazon.com</a>                             | Pencil sighting classic |
| Ctrl+Paint Measuring  | <a href="https://ctrlpaint.com">ctrlpaint.com</a>                       | Free measuring video    |

## Hobbyist

| Resource                  | URL   | Notes                          |
|---------------------------|---|--------------------------------|
| Classical Drawing Atelier | <a href="https://amazon.com">amazon.com</a>                       | Atelier sight-measuring method |
| Watts Atelier             | <a href="https://wattsatelier.com">wattsatelier.com</a>           | Paid online figure program     |
| New Masters Academy       | <a href="https://newmastersacademy.com">newmastersacademy.com</a> | Paid professional instruction  |

## Professional

| Resource                 | URL   | Notes                       |
|--------------------------|---|-----------------------------|
| Bargue Drawing Course    | <a href="https://amazon.com">amazon.com</a>   | Academic sight-measuring    |
| Aristides Lessons        | <a href="https://amazon.com">amazon.com</a>   | Advanced atelier method     |
| Angel Gagne Sight Sizing | <a href="https://youtube.com">youtube.com</a> | Professional technique demo |