Lightweight Posterior Walker

GNG2101 | Team D5

Meet the Team

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2nd-Year ELG

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1st-Year PHYS/ELG

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2nd-Year MCG

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1st-Year ELG

Meet the Client

Erica

- **Uses a walker to get around**
- **Relies on partner to move walker**
- **Unhappy with posture**

Fahad

- **Uses a cane to walk**
- **Cannot lift more than 15 lbs**
- **Most comfortable lifting 8 lbs**

Current Walker

Heavy

Unfolds

Clunky

Bad Posture

CLIENT NEEDS and PROBLEM STATEMENT

Lightweight

Increase portability

Easily Collapsible

Accommodate needs

Braking

Ensure safety

Sturdy

Ensure reliability

"Erica needs a lightweight, sturdy posterior walker that can brake, collapse with one hand, and fit compactly into the back seat of a car."

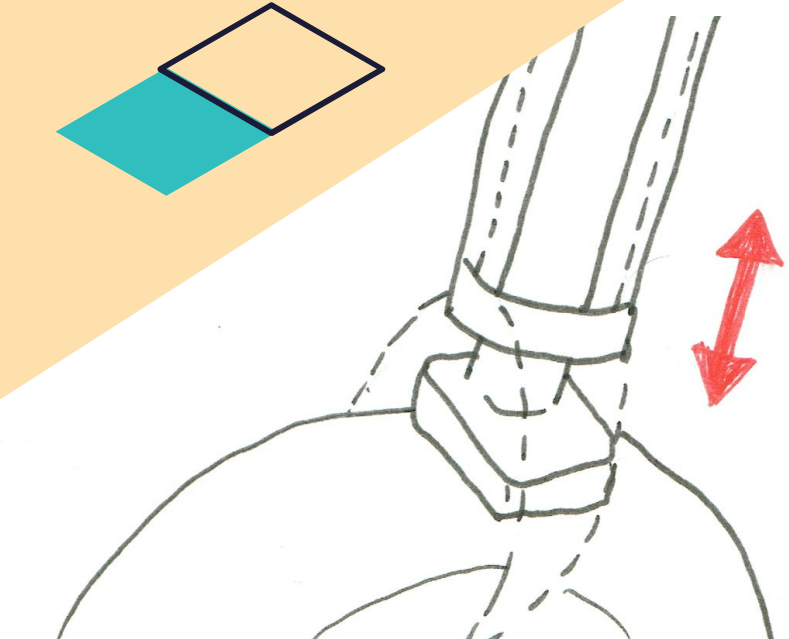
BENCHMARKING

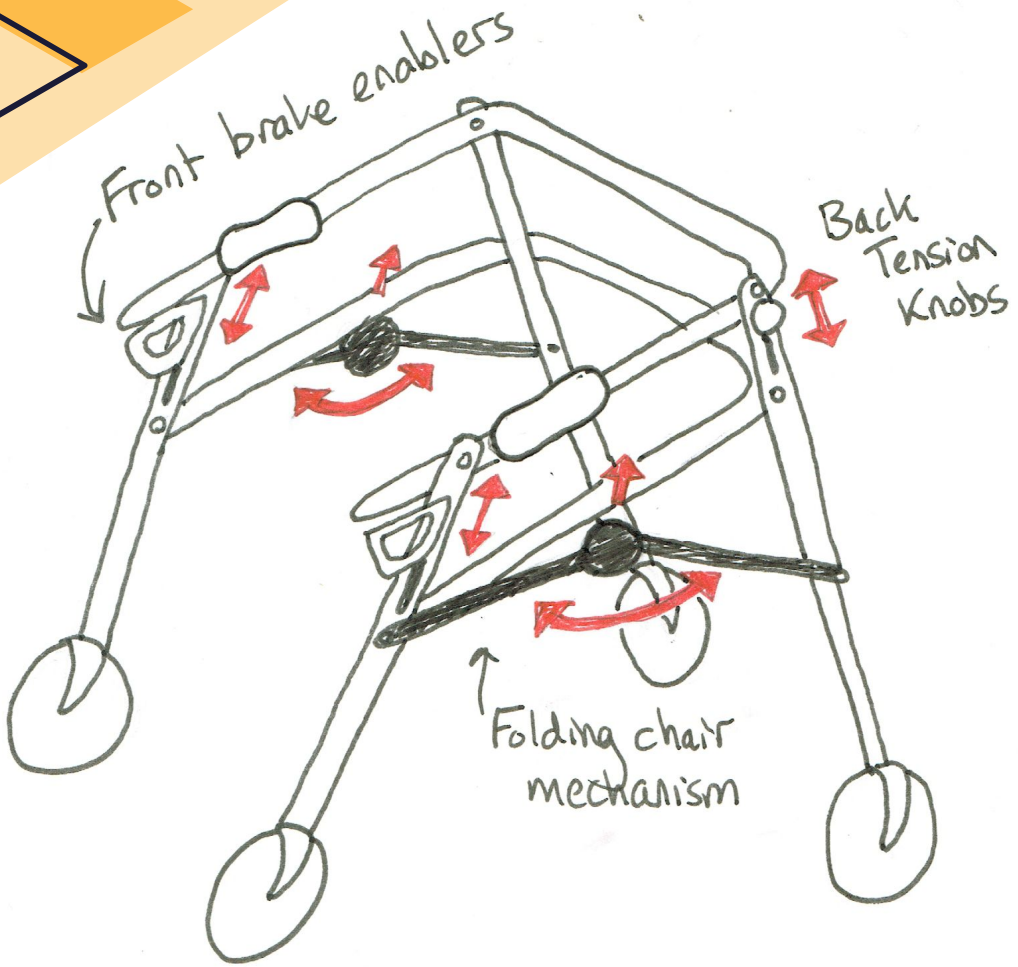
Cost	$51-429
Weight	15-22 lbs
Features	• Hand brakes • Slow-down brakes • Basket • Cushioning

Metrics and Target Specs

	Acceptable	*Ideal*
Product Weight	10 lbs	8 lbs
Collapse Width	6 in	4 in
Supported Weight	120 lbs	140 lbs
Wheel Speed	25 cm/s	20 cm/s

Conceptual Design





Feasibility

Resources

- Various workshops at uOttawa
- Brunsfield Center - Makerspace
- Client’s demands

Time

- Only 3 - 4 months to complete
- Following the project plan
- Advancement with project

Materials

- Low budget - 100$
- Ottawa - Surrounded by materials
- May need to make compromises

Skills

- 3 Electrical - 1 Mechanical
- Everyone has good ideas
- No issues

Prototype 1

Goal

Communication: Feedback from our client.

Comprehension: Compare folding mechanisms.

Plan

Construct → Compare features → Present to client

The Different Designs

First Design

- Pull up folding mechanism
- Made of cardboard, duct tape, zip ties, etc.
- Took a long time to make (4 hours)

Second Design

- Scissor Lift folding mechanism
- Made of Cardboard, duct tape
- Took very little time to make (1 hour)

Client Feedback / What We Learnt

Feedback

- ✘ Did not like Scissor Lift design
- ✘ Had previous bad experiences with moving parts, got stuck
- ✔ Loved pull up folding mechanism
- ✔ Were surprised by simplicity

What We Learnt

- ✔ Gave us sense of direction
- ✔ Tested components like height and size

Prototype 2

Goal

Learning: Fabrication methods, structural integrity.

Testing: Joints, dimensions, improvements.

Construction

PVC pipe, small casters, PLA, brass bushings, bolts, nuts, screws, string, latch.

Plan

Purchase → Cut → Drill → Assemble → 3D Print → Present to client

Client Feedback / What We Learnt

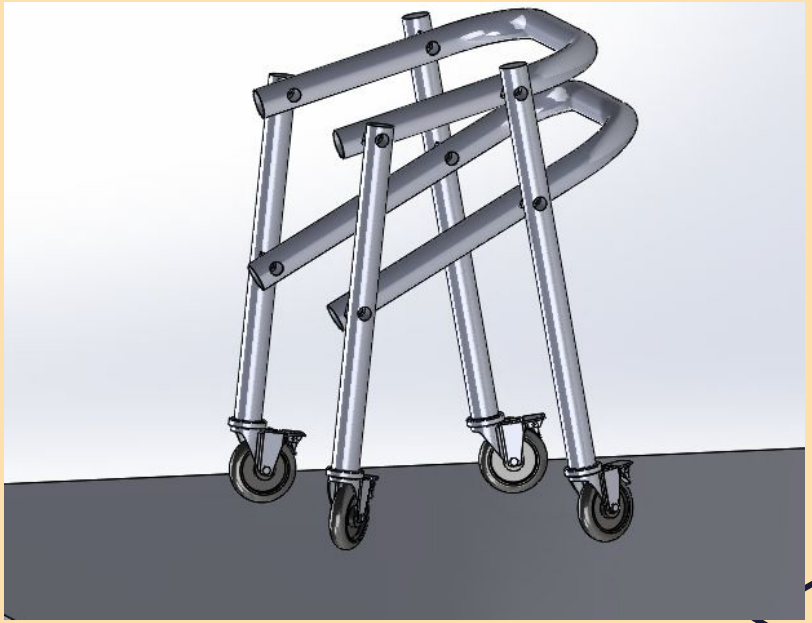
Feedback

- ✔ Overall positive feedback
- ✔ Liked the weight (5 lbs)
- ✔ Liked the simple locking mechanism
- ✔ Liked how smooth the movement in the joints were
- ✘ Asked for a braking system
- ✘ The bottom handle was too long

What We Learnt

- ✔ Reducing the size of the bottom handle (final measurement changes)
- ✔ Confident about the final weight of our prototype

Prototype 3



Goal

Testing: Structural integrity, turning (360 deg), braking, folding.

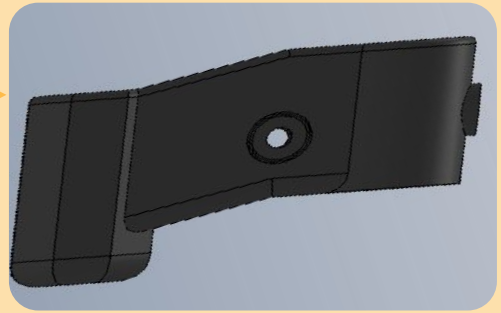
Construction

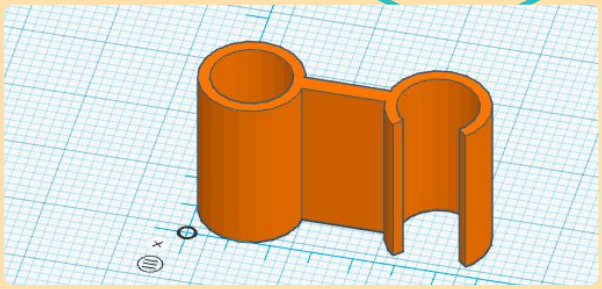
Aluminum tubing, brass bushings, polyurethane wheels, plastic, steel brake lines, PLA, foam.

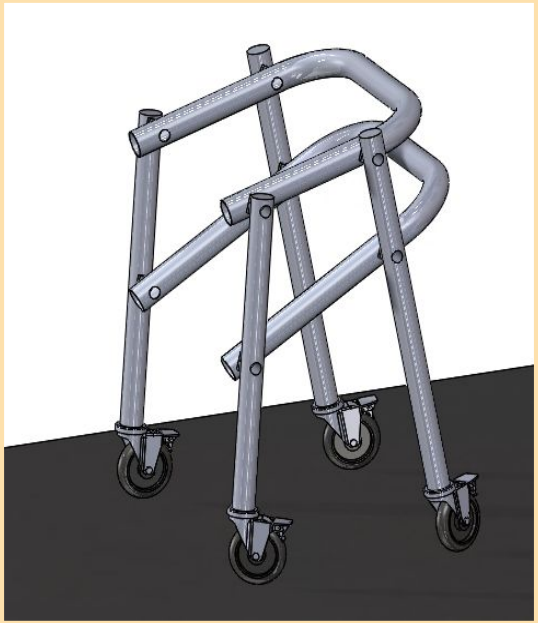
Plan

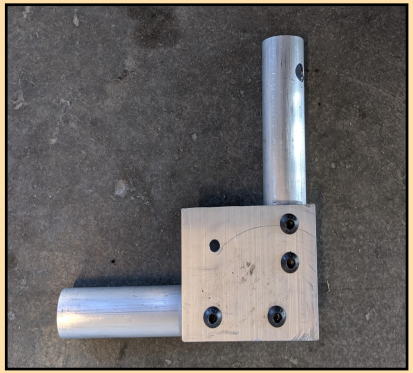
Purchase → Cut pipes → Drill→ Mill bushings → Reattach wheels → Print new brakes → Reattach brakes → Print latch → Attach foam → Final finishes

Plan Moving Forward









Business Model + Economics Report

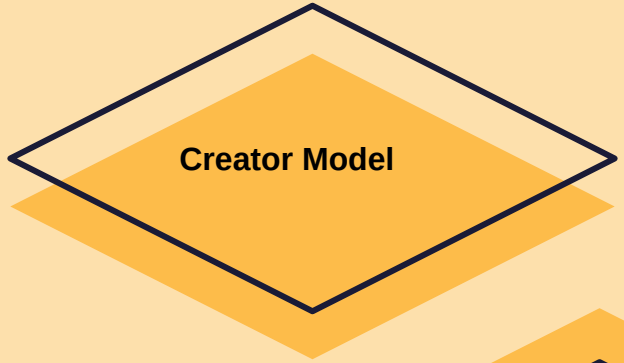
Basic Income Statement

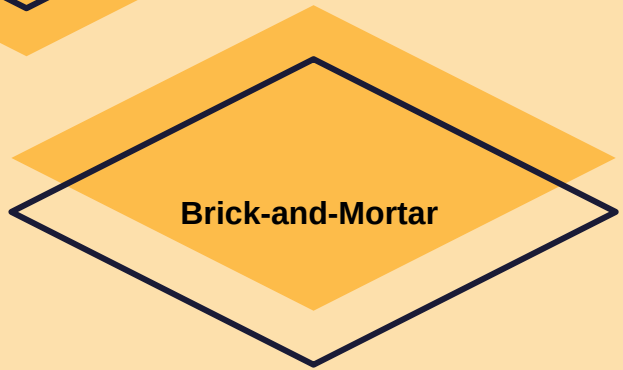
$100 Initial Revenue Stream

$40 Cost of Product

$120 Price of Product

2 yrs Break-even point





Conclusion +
Final Follow-Up with Client

Projected Fall Completion

- Machine shop availability
- Makerspace availability
- Final testing

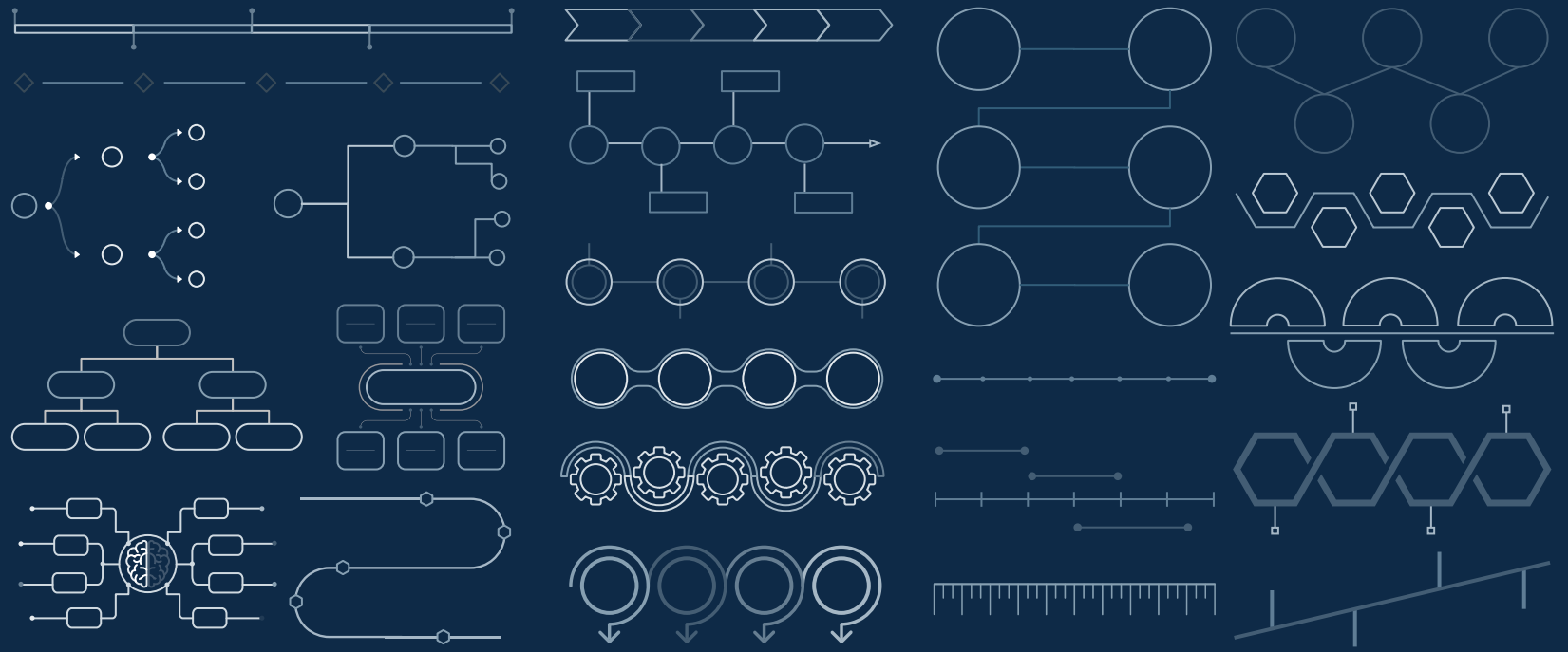
Product Weight	9 lbs
Collapse Width	5 in
Product Cost	$120

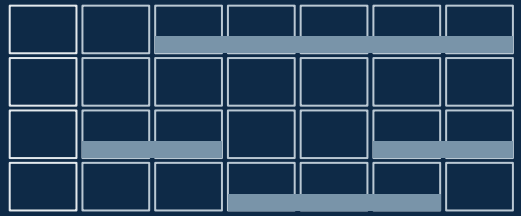
Thank you!

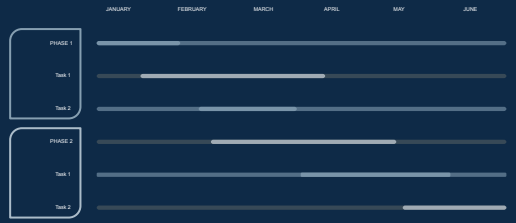
Please ask us
questions!

Use our editable graphic resources...

You can easily resize these resources without losing quality. To change the color, just ungroup the resource and click on the object you want to change. Then, click on the paint bucket and select the color you want. Group the resource again when you're done.



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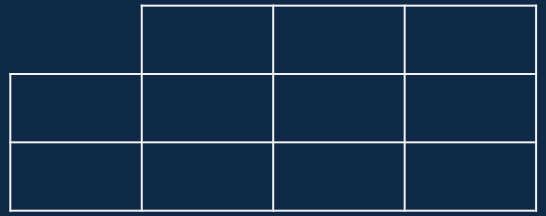

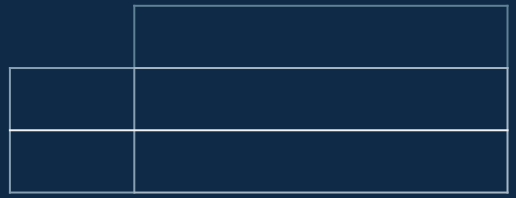

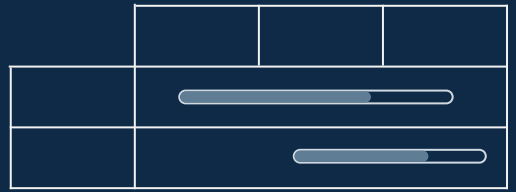

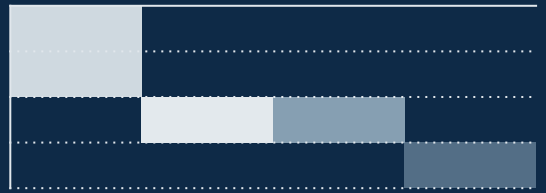

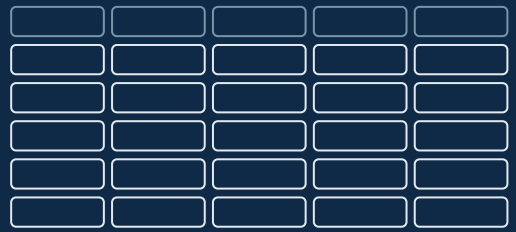

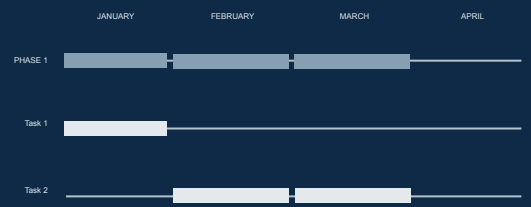
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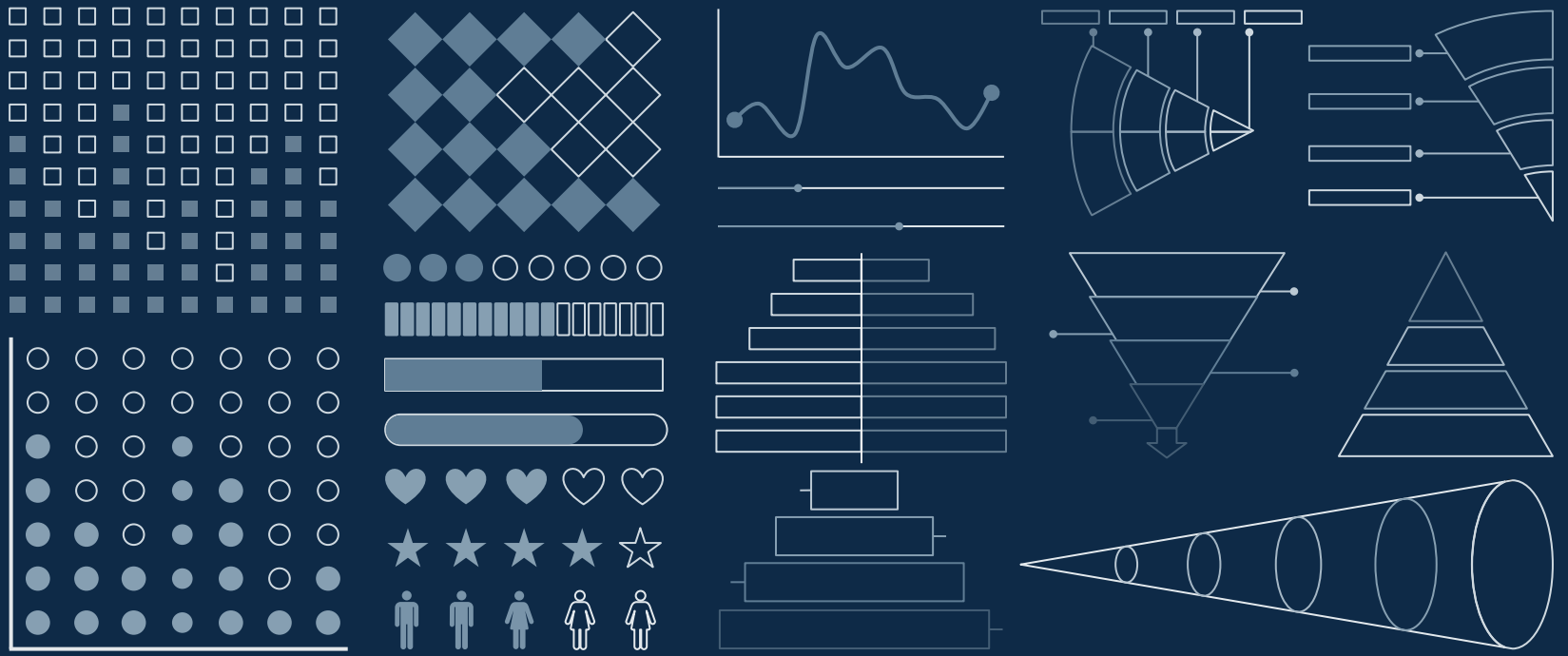


...and our sets of editable icons

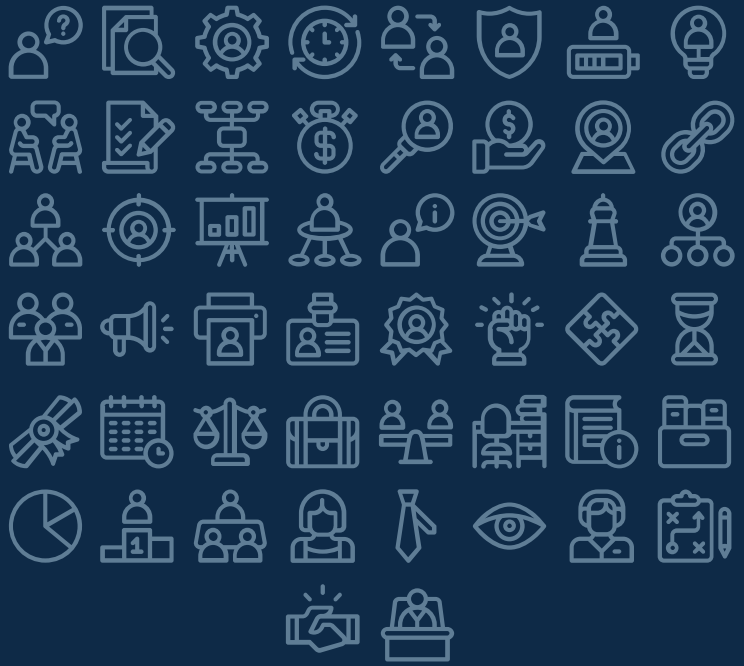
You can resize these icons without losing quality.
You can change the stroke and fill color; just select the icon and click on the paint bucket/pen.
In Google Slides, you can also use Flaticon's extension, allowing you to customize and add even more icons.

Educational Icons

Medical Icons

Business Icons

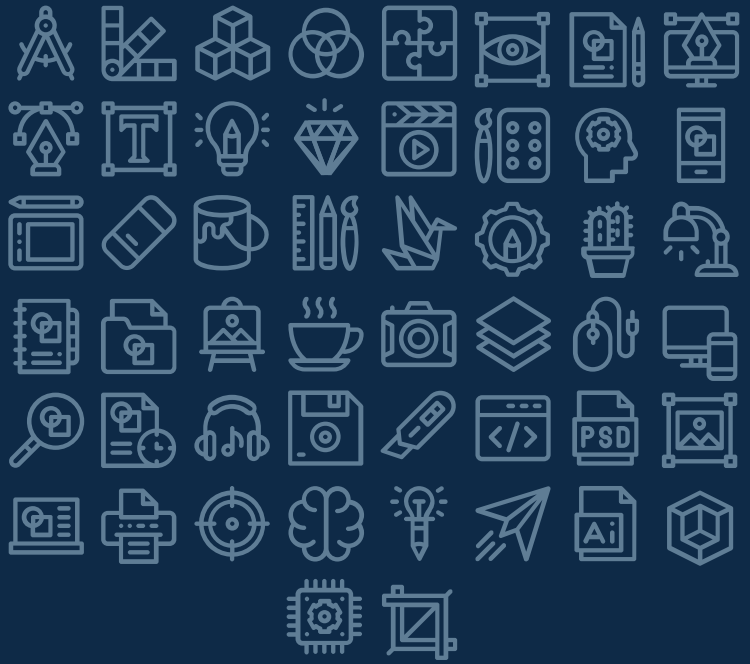
Teamwork Icons



Help & Support Icons

Avatar Icons

Creative Process Icons



Performing Arts Icons

Nature Icons

SEO & Marketing Icons

FOR EMPLOYERS

Higher productivity
Less accidents and sick leave periods
Reduced absenteeism
Less expenses

More difficult supervision
Less effective teamwork
Reduced acquisition of skills
Loss of confidentiality

BOOKS FOR MANAGING REMOTE TEAMS

- What Remote Managers Do Differently
- How to Communicate Well as a Remote Manager
- Process and Tools: How to collaborate effectively when your team is remote
- How to Build Social Connection in a Remote Team
- Performance Management in a Remote Team
- Onboarding and Training in a Remote Team
- Hiring, Compensation, and Benefits in a Remote Team
- Managing Up, When Remote
- Transitions: What do know and do before becoming a remote manager
- Setting Employees Up for Success in a Remote Environment
- Getting the Rest of Your Organization Onboard with Remote Work

IMPLEMENTING TELEWORK

OBJECTIVES

Coordinate the objectives that are to be met

POSITIONS

Consider the best positions for teleworking

TECHNOLOGY

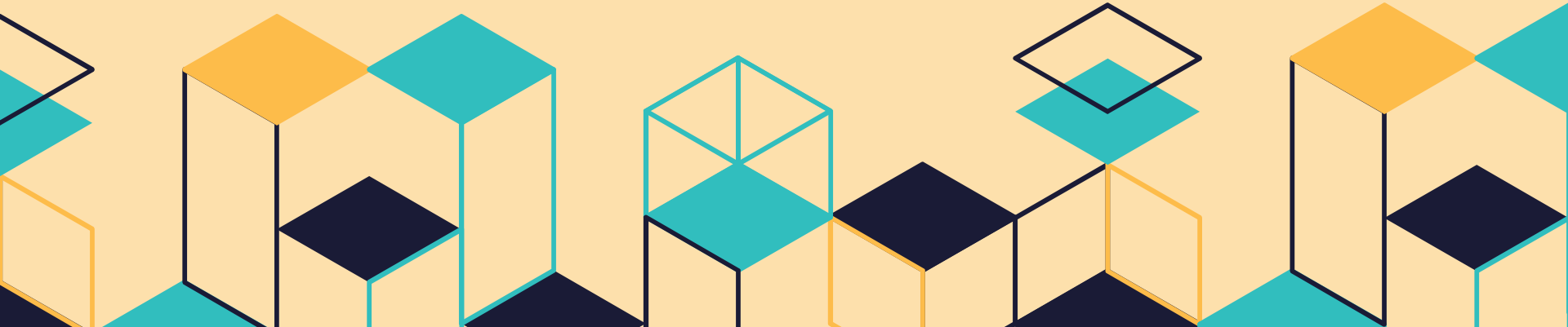
Determine all the needs of the teleworkers

MANAGEMENT

Manage teleworkers and their respective coordinators

$5,000,000,000

Estimated amount saved by companies in 2018 by letting their employees partially work at home



8 hrs
Working

4 hrs
Leisure

1.5 hrs
Cleaning

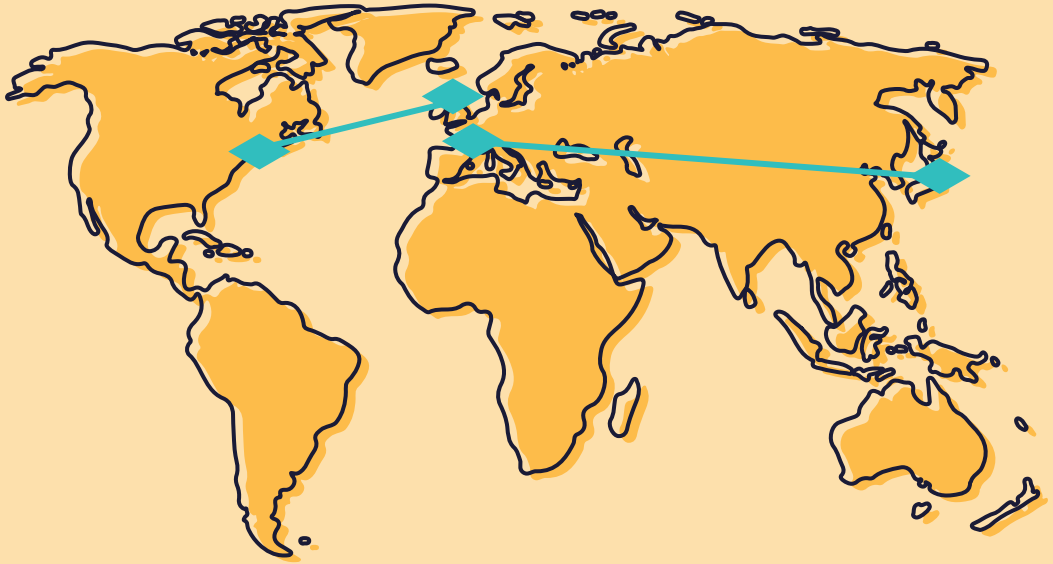
1.5 hrs
~~Transport~~

7.5 hrs
Sleeping

1.5 hrs
Exercising

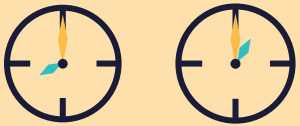
INTERNATIONAL MEETINGS

Best hours for meetings between distant cities



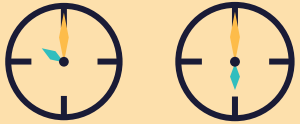
NEW YORK - LONDON

08:00 - 13:00

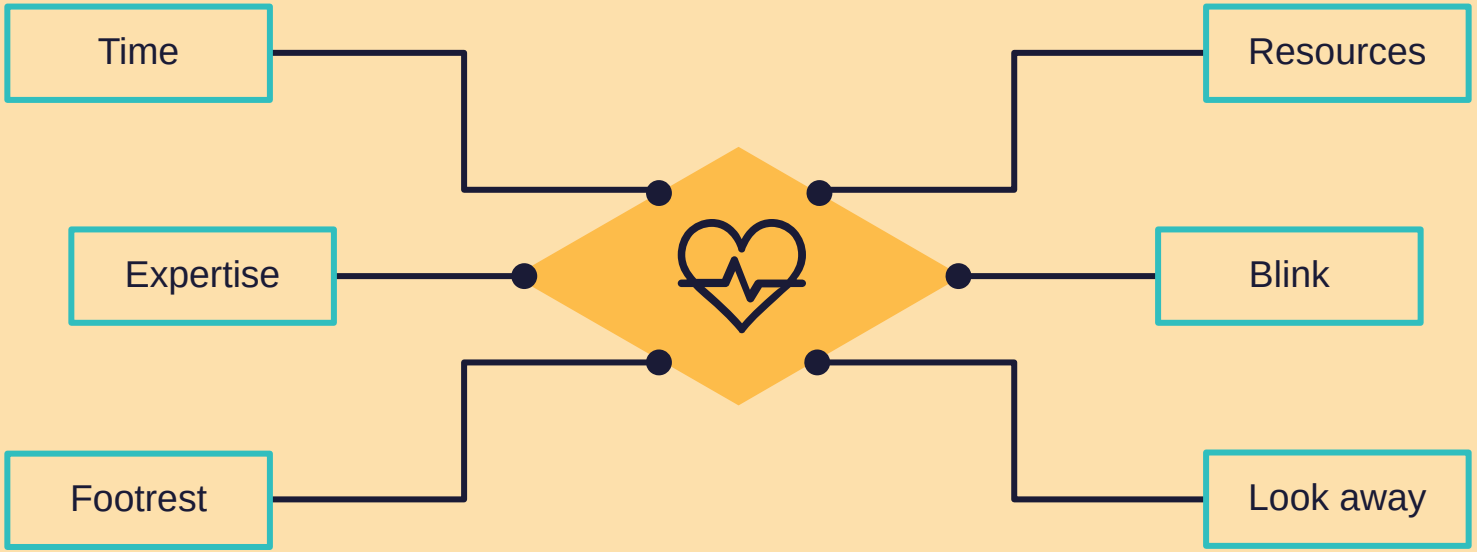


PARIS - TOKYO

10:00 - 18:00



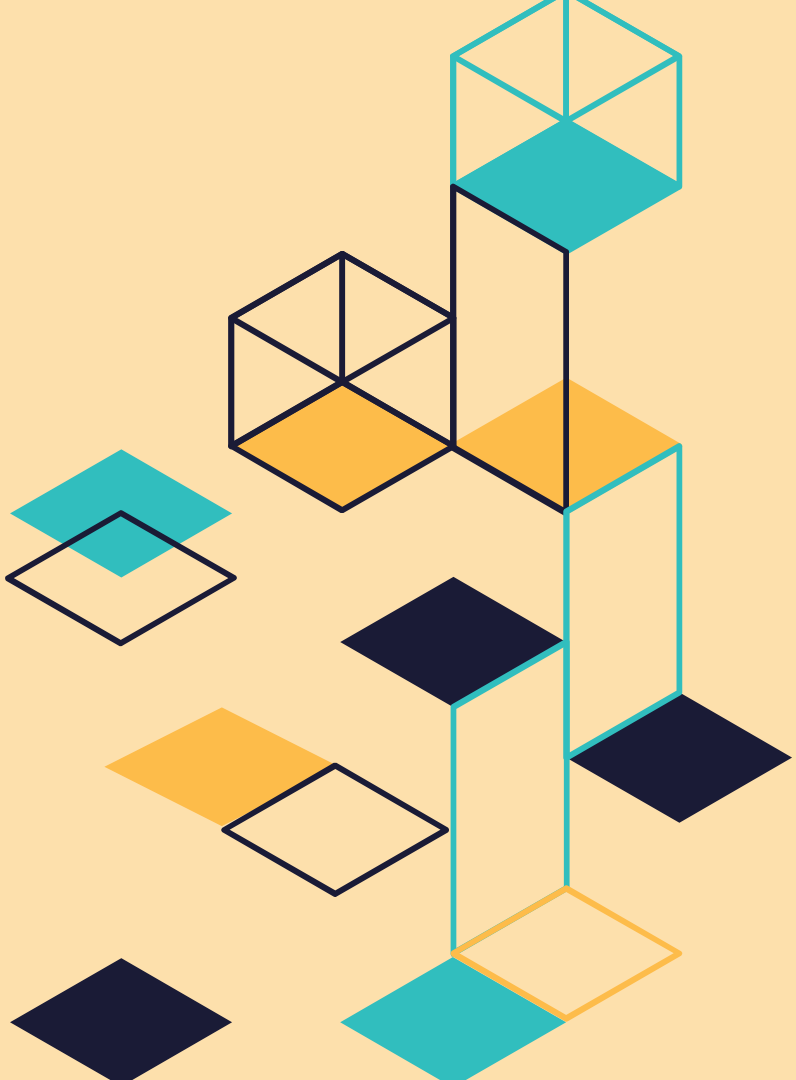
Feasibility



ALTERNATIVE RESOURCES

PHOTOS

- Woman writing and holding daughter at computer
- Blonde employee holding laptop on white background
- Top view of work desk with laptop and headphones
- Pretty woman stretching in office

VECTORS

- Abstract geometric business card template