

Applied Ideation and Design Thinking

for Assistive Technologies

Today

Thinking about problems

Brainstorming and ideation

Practice brainstorms

Scenarios and storytelling

Presentation and wrap



Thinking about problems

Observe

Investigate
Record
Analyze
Understand

Explain

Contextualize
Substantiate
Diagram
Articulate

Brainstorm

Explore:
Alternatives
Possibilities
Choices

Cluster

Analyze
Prioritize
Eliminate
Elevate

Express

Explain
Diagram
Mockup
Build

Evaluate

Try out on
stakeholders

Test with users

Discover

Define

Ideate

Evaluate

Prototype

Test

Iterate

Reframe

Redefine
Reprioritize
Redirect
Replan

Problem

Solutions

Ideation and inspiration

Genius is one percent inspiration
and ninety-nine percent perspiration.

Thomas Edison, inventor

Inspiration is for amateurs. The rest of us
just show up and get to work.

Chuck Close, artist

Brainstorming

Defined by Alex Osborn in 1939

“Storming a problem in a commando fashion”

Your Creative Power, 1949

Applied Imagination, 1953

Took on a life of its own

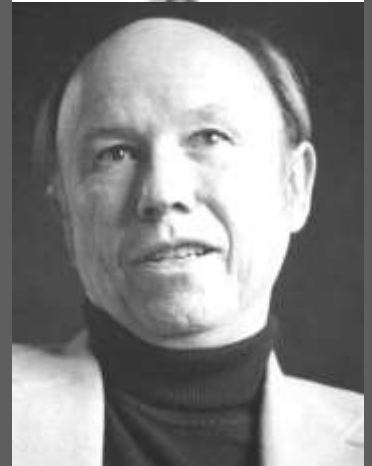
BBDO - Alex Osborn

MIT Creative Engineering Lab - John Arnold

Stanford Design Division - Bob McKim

IDEO

d.school at Stanford and Potsdam



The Osborn Rules
for
Brainstorming

Osborn Rule #1

DEFER
JUDGEMENT

Say Yes

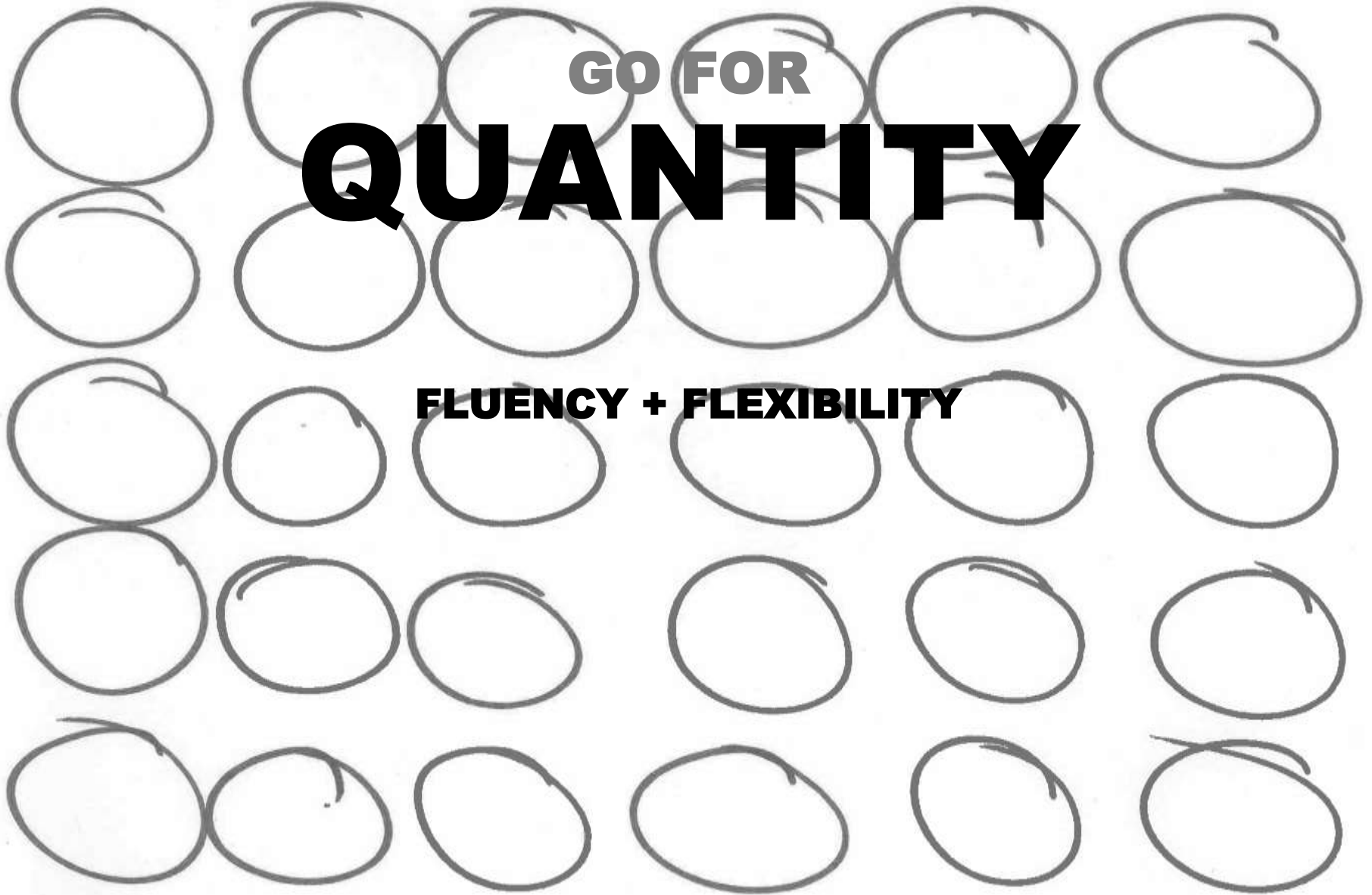
Fifty phrases that kill creativity

- **Our place is different**
- **We tried that before.**
- **It costs too much.**
- **That's not my job.**
- **They're too busy to do that.**
- **We don't have the time.**
- **Not enough help.**
- **It's too radical a change.**
- **The staff will never buy it.**
- **It's against company policy.**
- **The union will scream.**
- **That will run up our overhead.**
- **We don't have the authority.**
- **Let's get back to reality**
- **That's not our problem.**
- **I don't like the idea.**
- **I'm not saying you're wrong but...**
- **You're two years ahead of your time.**
- **Now's not the right time.**
- **It isn't in the budget.**
- **Can't teach an old dog new tricks.**
- **Good thought, but impractical.**
- **Let's give it more thought.**
- **We'll be the laughingstock of the industry.**
- **Not that again.**
- **Where'd you dig that one up?**
- **We did alright without it before.**
- **It's never been tried.**
- **Let's put that one on the back burner for now.**
- **Let's form a committee.**
- **It won't work in our place.**
- **The executive committee will never go for it.**
- **I don't see the connection.**
- **Let's all sleep on it.**
- **It can't be done.**
- **It's too much trouble to change.**
- **It won't pay for itself.**
- **It's impossible.**
- **I know a person who tried it and got fired.**
- **We've always done it this way.**
- **We'd lose money in the long run.**
- **Don't rock the boat.**
- **That's what we can expect from the staff.**
- **Has anyone else ever tried it?**
- **Let's look into it further.**
- **We'll have to answer to the stockholders.**
- **Quit dreaming.**
- **If it ain't broke, don't fix it.**
- **That's too much ivory tower.**
- **It's too much work.**

GO FOR

QUANTITY

FLUENCY + FLEXIBILITY



Osborn's checklist for transforming ideas

Put to other uses?

- New ways to use as is?
- Other uses if modified?

Adapt?

- What else is like this?
- What other idea does this suggest?
- Does the past offer parallel?
- What could I copy?
- Whom could I emulate?

Modify?

- New twist?
- Change meaning, color, motion, sound, odor, form, shape?
- Other shapes?

Magnify?

- What to add?
- More time?
- Greater frequency?
- Stronger?
- Higher?
- Longer?
- Extra Value?
- Plus ingredient?
- Duplicate?
- Multiply?
- Exaggerate?

Combine?

- How about a blend, an alloy, assortment, ensemble?
- Combine units?
- Combine purposes?
- Combine appeals?
- Combine ideas?

Minify?

- What to subtract?
- Smaller?
- Condensed?
- Miniature?
- Lower?
- Shorter?
- Lighter?
- Omit?
- Streamline?
- Split up?
- Understate?

Substitute?

- Who else instead?
- What else instead?
- Other ingredient?
- Other process?
- Other place?
- Other approach?
- Other tone of voice?

Reverse?

- Transpose positive and negative?
- How about opposites?
- Turn it backward?
- Turn it upside down?
- Reverse roles?
- Change shoes?
- Turn tables?
- Turn other cheek?

Rearrange?

- Interchange components?
- Other pattern?
- Other layout?
- Other sequence?
- Transpose cause and effect?
- Change pace?
- Change schedule?

Transformation cards

PRESENTED TO YOU BY THE
M.I.T. CREATIVE ENGINEERING LABORATORY
JOHN F. ARNOLD, PROF. IN CHARGE

"CHECK LIST SOLITAIRE"
ADAPTED FROM "APPLIED IMAGINATION"
BY ALEX F. OSBORN

DRAWINGS BY AUSTIN E. BAER
RESEARCH ASSISTANT

COMBINE!



HOW ABOUT AN ASSORTMENT?

COMBINE!



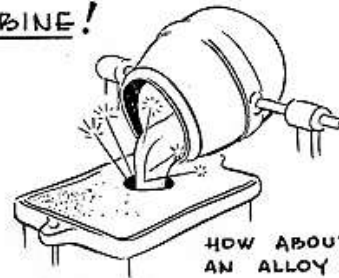
COMBINE IDEAS?

REVERSE!

REVERSE ROLES?



COMBINE!



HOW ABOUT
AN ALLOY?

SUBSTITUTE!



OTHER APPROACH?

PUT TO OTHER USES!



OTHER USES IF MODIFIED?

MODIFY!



CHANGE SHAPE?

REVERSE!



CHANGE SHOES?

Osborn Rule #3

GET RADICAL

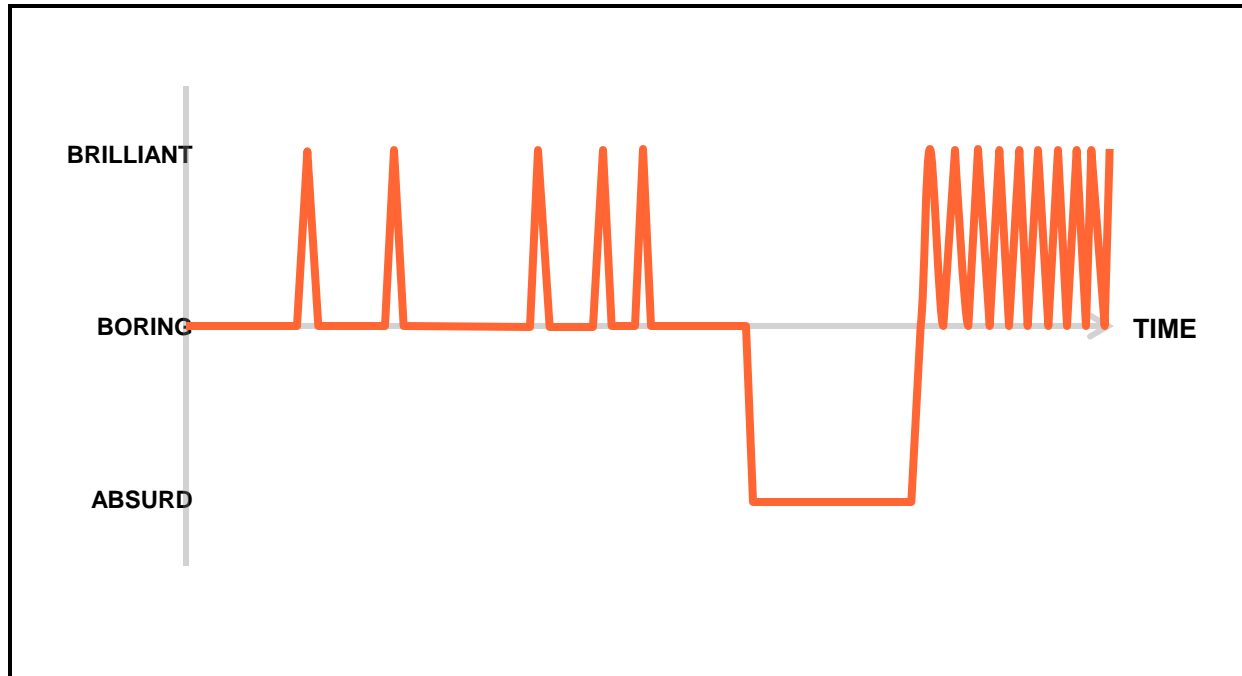
WILD WEIRD ABSURD STUPID

Easier to tone down than pump up



The idea curve

Illustrative representation of idea count



“Out of a hundred ideas, the first sixty ideas produced five that were actually new or different, the next twenty produced nothing but laughter, and ideas eighty to a hundred produced another ten that were amazing. Thankfully, we didn’t give up when the well ran dry around idea number sixty.”

LEAPFROG

Mash up

Build on other people's ideas

Let go of your own



Ground Rules Recap

Four content rules

Defer Judgment

Say Yes!

Save analysis and evaluation for later

Go for quantity

Fluency - lots of ideas

Flexibility - lots of *different* ideas

Get radical

Encourage wild, eccentric, improbable ideas

Easier to tone down than pump up

Leapfrog

Build on others' ideas

Let yours go into the mix

Four process rules

Stay focused on topic

A stray thread can throw you off

Turn it around to something that relates

One conversation at a time

Let everyone get their idea out

Bring side discussions onto the table

Headline it

Express the essence and move on

Maintain flow

Be visual

Get the right brain working

And, for best results...

Four setup tips

Explicitly agree

“Let’s brainstorm!”

“Yeah!”

Facilitate

“What else...?”

Record

Capture the thought

Time box

Define the play period



Exercise – Brainstorm a Project

Start with your problem

1. Form small groups
2. Pick one problem for this exercise
3. Brainstorm 15 minutes
4. Pick a solution
5. Present to the class
 1. **User**
 2. **Context**
 3. **How it works**



Creating solution scenarios

Five story components

User

Identify and characterize a user, based on the target user group

Context

Describe context or situation in which the problem exists

Problem

Describe an incident or condition that motivates the use of the solution

Solution

Show how they access and use the solution to address their need

Outcome

Describe the outcome of the situation - the payoff, the problem solved, the happy user



Better Brainstorms

Four content rules

1. Defer Judgment

Say Yes!

Save analysis and evaluation for later

2. Go for quantity

Fluency - lots of ideas

Flexibility - lots of *different* ideas

3. Get radical

Encourage wild, eccentric, improbable ideas

Easier to tone down than pump up

4. Leapfrog

Build on others' ideas

Let yours go into the mix

Four process rules

5. Stay focused on topic

A stray thread can throw you off

Turn it around to something that relates

6. One conversation at a time

Let everyone get their idea out

Bring side discussions onto the table

7. Headline it

Express the essence and move on

Maintain flow

8. Be visual

Get the right brain working

Better Scenarios

Five story components

1. User

Identify and characterize a user, based on the target user group

2. Context

Describe context or situation in which the problem exists

3. Problem

Describe an incident or condition that motivates the use of the solution

4. Solution

Show how they access and use the solution to address their need

5. Outcome

Describe the outcome of the situation - the payoff, the problem solved, the happy user