

The



**Duct  
Tape  
Network**

Guidebook

The Duct Tape Network Guidebook

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# Welcome to the Duct Tape Network!

We are so happy that you are going to lead a Duct Tape Network (DTN) Club!

This guide includes information to help you get a DTN Club started in your community.



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# Introductions



# What is DTN?

The Duct Tape Network (DTN) is a **series of fun, hands-on maker clubs** that encourage children (ages 7-10) to use cardboard, tape, wood, fabric, LED lights, motors, and more to **bring their stories and inventions to life**.

DTN gives young people the increasingly rare opportunity to build things that they care about. And, in the process, have fun, get excited, and work with friends.

DTN is about transforming ordinary spaces into extraordinary making spaces (for an afternoon, morning, or evening.) It is about using low-cost, low-threshold, everyday materials to get young people making and collaborating immediately.

DTN clubs include a lot of **tinkering time** complemented by occasional **team challenges**.

**We are so glad to have you join us as a DTN Facilitator!**





# Why is DTN important?



- Kids today don't have enough opportunities to explore their imaginations, tinker with their hands and engage in creating meaningful, open-ended projects.
- People need to be **creative**, problem-solvers in order to succeed in today's ever changing society and workforce.
- DTN Clubs engage kids in the creation of things that they care about before they lose their natural curiosity or get seduced by more consumer-oriented technology.

# How is DTN different?

The maker movement has taken off and there are many maker-oriented education programs. What makes DTN special is:

- We specifically target a younger age: 7-10.
- We believe in providing young people with as much **open-ended, creative freedom** as possible. We have tested ways to quickly create **pop-up maker-spaces** that get kids engaged immediately in making.
- While adults are often uncomfortable when there is no structure or project ideas, kids often need this open space to create projects that matter to them. We believe that we have struck a good balance with DTN. We provide project sparks and compelling materials that encourage kids to create, tinker, and explore.
- We believe the **making process** is important. We want kids to explore materials, to see how things work, and tinker regardless of whether this exploration results in a finished product.
- DTN believes in **accessibility**. We want kids to experience making wherever they are. We emphasize low-cost, low-threshold, everyday materials.
- DTN is a club. We plan to expand DTN to include: DTN 1, DTN 2, DTN 3 to provide new experiences for kids. For example: In DTN 2 kids may explore more electronics or in DTN 3 engage in Design Thinking to take their ideas to the next level



# Curriculum Philosophy

DTN was inspired by the philosophy of the "4 P's of Creative Learning". Keep these in mind as you set-up your space and work with kids:

- **Projects.** People learn best when they are actively working on meaningful projects – generating new ideas, designing prototypes, refining iteratively.
- **Peers.** Learning flourishes as a social activity, with people sharing ideas, collaborating on projects, and building on one another's work.
- **Passion.** When people work on projects they care about, they work longer and harder, persist in the face of challenges, and learn more in the process.
- **Play.** Learning involves playful experimentation – trying new things, tinkering with materials, testing boundaries, taking risks, iterating again and again.

\*MIT Media Lab Lifelong Kindergarten Group

# Getting Started



# Your Mission as a Facilitator

As a facilitator, your role is to encourage kids to make projects based on their own ideas (rather than following the steps of a recipe.) The way you set up your space, the materials and example images you provide, your own energy all contribute to this! When we start a new DTN Club we tell our participants:

The world needs more creative thinkers, problem solvers, and makers! In anything you want to do in the future, these are critical skills! We want you to create and think with:

- YOUR Head -- Make projects based on YOUR ideas. Solve a design challenge. Collaborate with friends. Stretch your brain.
- YOUR Hands -- Make things with YOUR fingers. Tinker with new materials or play with familiar materials in new ways.
- YOUR Heart -- Make something that you care about.

# Participants

DTN Clubs are designed for groups of 8-12 kids ages 7-10, but can be adapted to fit the needs of your team.

Participants might already be in an after-school club, Girl or Boy Scout Troop, neighborhood association, or participating in after-school enrichment activities at their school. Clubs might even meet in a facilitator's garage!

We suggest that kids sign-up for DTN to insure consistent participation. DTN Clubs often work best when there is a host organization that can help to promote and provide infrastructure (forms, registration etc.)



# Your Role

Your role is to run DTN Clubs in your community! We provide a 7-week curriculum as a starting point. We encourage you to adapt the curriculum to fit the needs and interest of your community. We recommend 2 facilitators for every 10-12 kids.

We hope DTN Clubs will continue long after the 7 weeks!

As a facilitator you:

- Secure the weekly space for your DTN Club to meet
- Provide and organize all supplies
- Plan and facilitate weekly sessions
- Communicate with families





# Is DTN Right for you?

DTN Facilitators love working with kids and making things!

This is the right role for you if you:

- Have 3-4 hours per week to plan, facilitate, and document your DTN Club
- Have a strong interest and commitment to provide creative learning experiences to young people
- DTN is fun! Ideal facilitators will bring their own playful and creative energy with them

\*(Depending on your location and your affiliation with this location, you may need to complete additional applications or perform background /CORI checks before working with kids.)





# The Space



As a DTN Facilitator you are likely **transforming an ordinary space** into a creative **makerspace**. Your space might be a classroom with desks, a kitchen table, conference room, or a garage. Well organized materials help you quickly set-up/clean-up for your club meeting.

# Open Studio Approach: Stations

The wonderful challenge for the DTN facilitator is to transform ordinary spaces into **Open Studio/ Maker Spaces** where kids access to materials and the space is appealing and inviting to create projects.

Create distinct **stations** for materials and activities in the same location each week so that kids know what to expect when they enter the space and can get started making right away. Depending on the space, you may need to combine multiple stations on the same tables.



## Recommended Stations

- ❑ Check-in Table: Toolkits
- ❑ Inspiration Wall
- ❑ Glue Station
- ❑ Common Materials
- ❑ Materials of the Day
- ❑ Documentation Station

# What happens at each station

- ❑ **Check-in Table:** Kids pick-up individual toolkits and check-in with facilitator or have a quick group meeting
- ❑ **Inspiration Wall:** Displayed in entrance of room with images that relate to the theme or materials of the day. These images then can be transferred into a binder to use as an inspiration book for future sessions. If space is limited, perhaps you just want to have inspiration images in a scrapbook for kids to flip through
- ❑ **Glue Station:** Disposable tablecloth for surface, powerstrip, glue guns and extra glue, gloves to prevent burns (safety instruction and rules needed)
- ❑ **Common Materials:** We recommend organizing all your materials in shallow, plastic bins that can be stacked and transported on a rolling cart. Each bin should be clearly labelled. Supplies should be in individual containers and bags for easy access and clean-up (for example a container for googly eyes, a bag for pipe cleaners) *See Supplies and Materials Section for complete list*
- ❑ **Materials of the Day:** Any day specific materials (wood, fabric, LEDs) arranged in shallow bins. We recommend keeping any electronics used (motors, LED lights, and batteries) in separate containers.
- ❑ **Documentation Station:** Where kids can have their projects photographed



# The DTN Curriculum



# DTN Clubs Format

Each DTN Club has its own distinct styles. We encourage you to find the structure and the pace that works for your participants and location. Suggested daily plan:

- **Getting Started:** Each week participants start the session by picking up their toolkit and taking a look at the images on the **inspiration wall or book**
- **Group Check-in:** If time permits, start with a quick group check-in to introduce any **Materials of the Day**, safety concerns, or reflect on ideas from the last session. This is also the time to introduce theme and tip cards for the day
- **Start MAKING in the Open DTN Studio** by either:
  - Experimenting with Material of the Day
  - Continuing project from week before (they are always free to do this without exploring the Materials of the Day)
  - Getting inspiration from:
    - Challenge and/or Tip Cards
    - Inspiration Wall
    - Themes
    - Guided support on new material of the day
- **Skill or Concept of the Day:** Some kids will delve right in without any support. Some might want some guidance. One facilitator might work with a small group to introduce a material (wood, LED) or concept (fastening cardboard together)

# A Sample DTN Club Meeting

Welcome: Pick-up Tool Kits and Check-in	
Open Studio	Skill or Concept of the Day
Open Studio	
Cleanup	



# Your first DTN Club Meeting

You can start your DTN Club any way that you like! We recommend that your first meeting be the most structured so you can get kids working together, introduce materials, goals, safety issues etc. Here is an example of a first day outline:

- Quick welcome and introductions
- Group challenge in teams (newspaper tower, gumdrops and toothpicks, papercup castle)
- Introduce goals of DTN connected to the making and creativity that happened during challenge
- Make and personalize toolkits and journals
- Review space and safety concerns
- Make a take home project! We feel that it's important for kids to make something relatively quick that they can take home the first day. LED's and simple craft materials lend themselves to this type of project. For example:
  - Creating a name badge with an LED light
  - Magic wand or flashlight with LED



# Overview of a 7-week DTN Club

## **Day 1: DTN Overview and Getting Started**

**Activities:** Introductions, group design challenges, make your own toolkit and journal, simple projects with LED lights.

## **Day 2: Cardboard Boxes**

Themes: Toys and games, future houses

## **Day 3: Craft and Motors**

Themes: Gardens of the future, 3-D Creatures

## **Day 4: Wood**

Themes: Toys and structures and using thread and string

## **Day 5: Studio Time** (no additional themes or materials)

## **Day 6: Studio Time**

What can you make to engage your families in DTN)

## **Day 7: Open House:** Create something for the day using helium balloons

# DTN Sample Club Meeting Agenda

## Day 2: The Making Begins: Cardboard Box Designs

### Goals

- Lots of time to work on their own ideas
- Space for creativity and hands-on projects
- Leave with something that they have made

### ACTIVITIES:

#### 3:00-3:05 **Welcome: Get toolkits as you come in!**

- Introduce **challenge and tip cards**, **inspiration board** images and **Material of the Day: Cardboard**
- **Introduce theme suggestions:** Game, neighborhoods, houses of the future
- Review stations: Common materials, guided table, glue and documentation stations
- Review glue gun safety and cutting cardboard safely
- Any project sharing from previous week or reflections on the past session (since it is very difficult to do this at the end!)

#### 3:05-3:45 **Open Studio**

Guided Table: Optional time at guided table with facilitator focusing on skill such as cutting cardboard or attaching pieces together

#### 3:45-3:55 **Clean-up**

- Make notes in journal for next session
- Any quick sharing--if time permits

# Open House





# Is it working? Reflecting on your meeting

Chances are, as a facilitator you will know when you have had a great session. Here are some questions you can ask yourself as you reflect on your club meeting and plan for your next!

## Did kids have a chance to:

- Get messy
- Try something new
- Be curious and ask questions (wonder)
- Make mistakes
- Collaborate with friends
- Share ideas
- Get a new idea and figure out how to execute it with DTN materials
- Feel good about something they have created or experimented with
- Get engaged in making something



# Working with kids

As a DTN Facilitator everything you do stems from the participants in your club. The best plan may be derailed if kids are too tired, not engaged, or frustrated. Here are some very basic suggestions that we hope that you will add to over time!

**Know your audience:** If kids are coming to you after school, do they need time to run around or have a snack before starting? What do you need to do to ensure a positive meeting?

**Collaboration:** DTN works best when kids are naturally working together. Sometimes you may need to do a game or challenge to jumpstart collaboration. Sometimes you might ask one child to mentor another.

**Creative Processes:** Some kids jump right into the making process, others might need some more one-on-one mentoring.

**Back-up Plan:** Always have a plan B in your pocket for when things are not going well (kids too tired, bored, etc.) This might be adding in a creative challenge game for everyone or inviting one child to play a game or run around outside.





# Supplies and Resources



# Personal Toolkits

Personal Toolkits are an important ingredient for your DTN Club. We recommend that each participant create their own toolkit the first day of the club and that they pick-up their toolkit when they arrive each day. This insures that they have their own scissors, pencils, journals to use during each club meeting. Often kids will spontaneously use their journals just because they are in the toolkits! This is a recommended list of supplies for a starter toolkit:



- Toolkit case or pouch
- Scissors
- Pencils and crayons
- Small journal

## Add in overtime:

- Mini-staplers
- Tape measure or ruler
- Vibration and toy motors (1)
- LED (3)
- Batteries and battery holder

Have the kids personalize their toolkits with tape, makers, lights...

# Shared Materials

This is a list of the basic shared materials to start with. We are sure that your list will grow. Most of these materials can be purchased cheaply at office supply stores, craft stores, or found in your recycling bin!



- ❑ **Tape:** Masking, DuctTape, Scotch
- ❑ **Glue:** Glue sticks, hot glue
- ❑ **Scissors** (large)
- ❑ **Hole punchers**
- ❑ **Fasteners:** Brads, rubber bands, staplers, clothespins, paperclips, thumbtacks
- ❑ **Craft supplies:** Googly eyes, pom poms, pipe cleaners, popsicle sticks, pipe cleaners, toothpicks
- ❑ **Cardboard:** Tubes, cartons, boxes
- ❑ **Drawing Materials:** Markers, crayons, permanent markers
- ❑ **Paper:** Construction, drawing paper, wall paper, patterned paper
- ❑ **Misc Items:** Tinfoil, contact paper, plastic bags



# Materials of the Day



There are some materials that you may decide to highlight on a particular day.

Wood or fabric are two good examples.

For wood, your Materials of the Day Container might include:

- **Popsicle sticks**
- **Skewers**
- **Small Wood Parts**
- **Clothes pins**
- **Toothpicks**
- **String and thread (for attaching wood together)**

You might have also selected images for your Inspiration Board that include wood projects as well as specialized Tip and Challenge Cards.

# Other Materials and Ideas

## **Materials From Home**

Kids are also invited to bring their home projects or materials to keep working at the club. For instance, it's ok for them to bring in a T-shirt or a broken toy from home (or special paper, cardboard, balls.)

## **Projects going home**

We hope that club activities continue at home. Often kids will want to bring their projects home to keep working on them. We encourage this, putting the responsibility on the child to bring the project back (if they want) the following week. We do suggest that you **document** any projects that are going home!

## **Guest Artists**

If you find that your DTN Club needs a little inspiration (perhaps half-way through) think about inviting in a guest artist for the day!

## **Constraining Materials**

You may find that having lots of compelling materials is inspiring to some kids, but can overwhelm others. Experiment with constraining materials. For example, one day you might have just popsicle sticks and cardboard and glue!

# Support Materials

Some kids arrive at DTN knowing exactly what they want to do and can't get started. Perhaps they want to continue working on a project from the previous week or they have brought in something from home to work on. Others may get ideas from DTN Challenge Cards. We like to mention these cards at the introduction times and then leave them sprinkled around on the work tables for kids to read.



DTN Cardboard Box  
CHALLENGE CARD:

BUILD YOUR DREAM HOUSE or  
ROOM.....



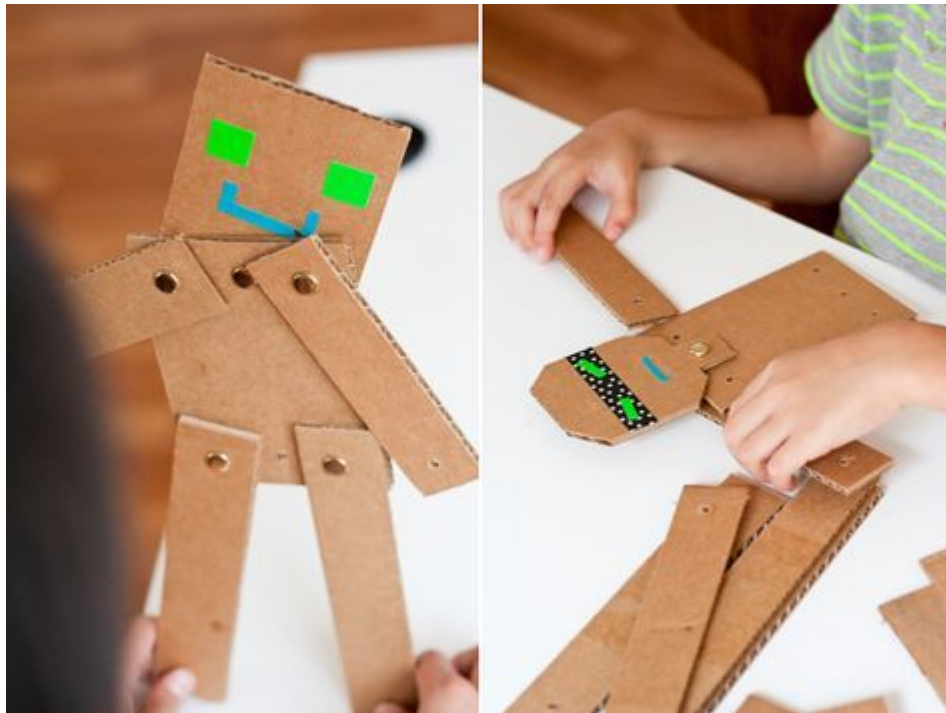
DTN Cardboard Box  
CHALLENGE CARD:

What would houses of the future  
look like?



# DTN TIP Card Samples

These cards are used to visually introduce some hints to help kids use the materials of the day. For example, in the cards below help kids think about ways to attach cardboard parts using brads. We like using these tip cards because it's an organic way for kids to get support or inspiration.



# Where to find inspiration online

**Design Squad:** [pbskids.org/designsquad/](http://pbskids.org/designsquad/)

**Maker Education:** [makered.org/](http://makered.org/)

**Artful Parent:** [artfulparent.com/](http://artfulparent.com/)

**Tinker Lab:** [tinkerlab.com/](http://tinkerlab.com/)

**Imagination Foundation:** [imagination.is](http://imagination.is)

**The Tinkering Studio:** <http://tinkering.exploratorium.edu>

# Wood





# Open Studio time



# Cardboard Boxes





# Open Studio and Open House







